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# The Large Place Taken by Alloy Steels

## A British Metallurgist Discusses the More Recent Developments in Connection with Vanadium, Chrome, Tungsten and Molybdenum—Iron Foundry Progress with Alloys

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IT is difficult to mention any branch of man's activities in which advances during the last 20 years are more marked than in that which concerns itself with metals and alloys. Any really detailed consideration of the large number of sections into which this subject could be divided, and again subdivided, is out of the question in the space of a single article.

The first differentiation which naturally suggests itself is that of the ferrous from the non-ferrous alloys. But the dividing line must not be observed too rigidly, as witness that very important section of industrial alloys of nickel, chrome and iron of which nichrome and kenic are notable examples.

Each of the main divisions again may have its components subdivided into two groups—the one comprising those which provide finished material for the engineering user, and the other comprising those which, while of themselves of no such use, nevertheless are capable of modifying profoundly and beneficently the properties of the "engineering" metals. Any considerations of advance in the inherent quality of those metals must be accompanied by concurrent consideration (a) of the methods and processes involved in their production and (b) of the great accumulation of knowledge of the principles and practice of their improvement by thermal treatment.

### The Main Advance in Steel

Further subdivision into groups of the ferrous engineering materials naturally leads to their classification into (a) Wrought iron, (b) Cast irons, (c) Steels. The line along which we have advanced farthest and at the most increasingly rapid rate in the period under review has undoubtedly been that of steel. Here the ferroalloys have played the leading rôle, of enormous importance in itself, and strongly supported by improved methods of manufacture and also by greatly increased knowledge and practice of heat treatment.

Principle and practice in the manufacture of crucible steel have remained practically unaltered. Production of steel on the open-hearth, if remaining unaltered in the main principles underlying its practice, has been improved greatly as to the efficient handling of larger bulks, new methods of furnace construction, speed of working, scientific knowledge as to the desirable conditions of slags and of furnace atmosphere, and fuel economy. This improvement in open-hearth practice has led to the logical, but necessarily gradual, supersession of the Bessemer process—a process which has proved nevertheless of inestimable value as a step in the ferrous industry.

The most marked stride forward undoubtedly has been in the direction of the electric production of steel. The wide extension of our knowledge of the principles of, and the results obtainable by, heat treatment has been accompanied by corresponding improvements in plant and apparatus for applying that knowledge practically in industry. In this connection the use of electricity as a heating agent has played, and is playing increasingly, an important part. The latent qualities of a steel are susceptible to immense improvement resulting from its correct heat-treatment, and it is those *latent* qualities which are vastly increased by the correct incorporation of alloys with the steel. The industrial development of alloy steels during the last 20 years has indeed been immense; the demands of engineering today are such that they could not in the light of our present knowledge possibly be met by materials other than the treated alloy steels.

### Early Alloy Steels

A short generation ago our knowledge of alloy steels, limited in its details at that, was practically confined to open-hearth steel containing a few per cent of nickel, to crucible steels of the Mushet self-hardening class containing a few per cent of tungsten, and to the manganese steel of Hadfield, which had proved in practice so revolutionary in resistance to abrasion. The advent of the internal combustion engine, and the development of those products which it made possible —notably the automobile and the airplane—changed engineering conditions and demands completely. As is usually the case where no contravention of a natural law is involved, demand created supply. The metallurgist rose to the occasion and with the technical aid and practical cooperation of the engineer a high step in progress was surmounted. The chemist and physicist bore no inconsiderable portion of the brunt. The advance was made by means of the studied incorporation of alloys with mild or medium carbon steels (the class of steels known scientifically as "subsaturated") and correct heat treatment of the wrought product. As the action of an alloy addition to such a steel may lie along three main lines, two or more alloys are generally added.

Vanadium retains its position as the master alloy, since its actions may proceed along all three lines, in which power it is unique among alloys. Its use in the open-hearth steel branch is world-wide but preponderates in the United States. Open-hearth steel is quite extensively made with it in Great Britain, but in that country the main use of vanadium is in the steel products of the crucible and of the electric furnace. Chromium is almost invariably used concurrently with it, occasionally with the further accompaniment of nickel. Still more occasionally nickel entirely displaces the chromium addition. Steels of high static excellence are produced by the incorporation of chromium and nickel only, but these exigently demand exact heat

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treatment in order to bring out their best static properties.

### Future of Molybdenum

The use of molybdenum additions to open-hearth steel is proceeding apace. Again such use at present is chiefly confined to the United States. In Great Britain the use of molybdenum is mainly in the products of the crucible and the electric furnace, generally as an auxiliary to, and in isolated cases a complete substitute for, tungsten. Molybdenum has undoubtedly a great future before it in the engineering steels. I say advisedly that the chief bar to the rapid advance of its use has lain in a point hitherto neglected by technologists. That point has reference to the subject of dissociation, with which are inextricably wrapped up the phenomena of solution. It is in my mind an undoubted fact that the ideal bath of molten steel should consist of an elementary solution, free as far as possible from inclusions. If an alloy contains a compound —generally a carbide—undissociable in the temperature zone normal to good steel making practice, the best (or even reliably constant) results will never be obtained from it. And in this connection ferrochrome, ferrovanadium and ferromolybdenum alloys must especially be scrutinized. One of the greatest sources of complaint in connection with the use of molybdenum has been that it segregates so badly. The observed differences of molybdenum content have not been due to segregation proper, but rather to manifestations of insolubility and the laws of gravity. The net result is a badly balanced steel with foreign inclusions, difficulty in fabrication, bad test and service results, and a wrongly formed conclusion as to the value of an auxiliary element potent for extreme good.

I have said that the earliest improvements were directed in steels of the new era to the increase of static excellence; that is to say, in the combination of increased tenacity with ductility. But service behavior did not always accord with the results of the testing laboratory, and increasing attention was paid to dynamic testing. Dynamic attributes logically must be the determiner of service value. In other words, static tests form the basis of calculated design, and dynamic tests that of the factor-of-safety margin.

The improvement of steel was developed along these joint courses, increasingly so as the result of the mechanical exactions of the European war. This international cataclysm brought into prominence and intensified investigation as to the resistance of metals to ballistic shock.

### The Stainless Steels

But a new trend had been given to the line of scientific investigation in the last few years. It had long been recognized that two of the greatest enemies with which the users of ferrous metals had to contend were rusting and corrosion. The routine metallurgist had merely been impressed by the achievements of Hadfield in connection with his manganese steel—really a ferroalloy of manganese coming into the naturally "austenitic" or "polyhedral" steels, a group quite distinct from the "subsaturated" steels used almost exclusively in engineering. The thinking metallurgist had been impressed by the possibilities opened up in other directions by exploration of this field of iron alloys, in which was discovered and developed that series of steels now commercially known as "stainless." This name was somewhat unfortunate. It would scarcely be logical to dub any steel, however great its tenacity, as unbreakable. One cannot conceive any metal which cannot be stained; the interpretation of the name, therefore, should be inferential rather than literal and should be taken as implying steel of extremely high resistance to oxidation and corrosion in the circumstances attendant upon its legitimate use. Steels of this description—for the term "stainless" covers a series and does not apply merely to one individual type of a class—have attained or are attaining great commercial prominence. The best known variant at present is naturally that used in the production of table cutlery, but the engineering potentialities of the series are great.

Essentially, "stainless" steels for different purposes may be said to contain from 12 per cent to 14 per cent of chromium, balanced and treated otherwise as the circumstances of the case may require. Obviously their production calls for some 20 per cent of their weight of the alloy ferrochrome, which alloy should be as low as possible in carbon content, and far preferably of the carbonless variety.

### The Later Stainless Iron

The fact that the "stainless" steel used in the manufacture of cutlery did not lend itself readily to deep stamping operations led to the inception of the more pliable material known in the trade as "stainless iron." If the term "stainless" is one to be deplored in the case of its steels, the total nomenclature of the newer material is still more deplorable. Commercial "irons," as we understand the name, are precipitated materials, the white-hot granules of precipitated iron being collected mechanically from the bath (of the puddling furnace) and subsequently welded together, with the expulsion of the very fusible slag, or "cinder," interspersed in their aggregation. It is quite impossible to imagine granules of iron co-precipitated with, and each containing in absolute solution a regular—or even any —chromium.

The metal commercially called "stainless iron" is really a dead-mild steel, containing in solid solution the necessary amount of chromium. In its preparation the use of "carbonless" ferrochrome is obligatory.

### Back to the Definition of Steel

This point brings up the old contention as to a correct definition of steel. None exists, nor can exist, but the most satisfactory working one in my opinion is that in essence "steel is a compound of iron, with more or less carbon, which can be wrought and shaped plastically when solid and red hot, and which in the last stage of its preparation previous to fabrication has been cast from a completely fluid condition."

The above definition falls short in that it does not include those steels (a very small proportion of the total tonnage of steels produced) which are made by the cementation of wrought iron, subsequently piling and welding the resultant bars. These steels, however, as it is, generally carry a prefix to their nomenclature; e.g. "shear steel," "double shear steel," "blister steel," etc.

That the "polyhedral" or "naturally austenitic" series of steels has produced and is producing a revolutionary class of industrial metals is best evidenced by the fact that into it come, for example, the high-speed steels, in their present form solid solutions of tungsten in iron fortified with chromium and stabilized with vanadium, and also those variants of the same admixture which have proved their great value, since they retain a large modicum of their strength at high temperatures, in the valves of internal combustion engines.

And the series of steels which have provided during the last few years a revolution in magnet construction fall into the same class, they being in effect solid solutions of 20 per cent to 30 per cent cobalt in iron.

### Advance in Cast Iron Metallurgy

Considerable progress has been made in the technology of the cast iron industry, the major part in the undoubted improvements conferred upon its product by electrical melting and treatment, and also in the development of what is known in the trade as semi-steel —a name by the way scientifically to be deprecated. Modifications of commercial cast iron by means of metallic additions have not been without attention, and are not without practice. This practice is much more general in the United States than in England. In the latter country but few foundries make use of alloys and then only in special cases. The object of the use of an alloy in the iron foundry is in most cases either to increase resistance to chemical attack, to decrease deterioration under the actions of fire or abrasion, to eliminate porosity at change of section, or to regulate depth of chill. Of the alloys used in the iron foundry ferrovanadium is the most prominent, while

ferrochrome, nickel and aluminum are also used for one or other of these objects. Ferromolybdenum is also occasionally used, but published results of its use in cast iron remain chiefly experimental records.

Knowledge and methods for the production of wrought iron remain reasonably in *statu quo*, as has, broadly speaking, scientific knowledge concerning it.

### In Non-Ferrous Metallurgy

Great advances in non-ferrous metallurgy have been brought about, partly by means of alloy additions to existing metals and alloys, and partly through new combinations of them. If the improvement of their means of production has not been so marked as in the case of steel, it has nevertheless been notable, chiefly in the progress industrially of electric melting and refining.

From the point of view of composition the alloys of nickel and the alloys of aluminum have provided the most notable examples of advance. The series of alloys of the former metal with iron and with chromium (they may be looked upon as akin to "stainless" steels in that their balance is somewhat similar but that the majority of their iron has been replaced by nickel) have proved of great industrial value. Alloys of this series are remarkably strong, ductile, tough and non-corrodible at ordinary temperatures, while they do not oxidize even at temperatures approaching 1000 deg. C. (1832 deg. Fahr.). Most notably, and unlike steels, they retain a very large proportion of their initial strength at this temperature also. These properties, together with the facts that they neither warp, buckle nor crack at high heats have made them very valuable industrial components.

The knowledge and application of additive alloys certainly has marked an immense advance in the progress of industry, and it is almost impossible to foresee the heights which that progress will attain.

## EXPANDING ACTIVITIES

### Plans for Increasing Usefulness of Bureau of Foreign and Domestic Commerce

WASHINGTON, June 4.—With an increase of approximately $450,000 over the regular appropriation becoming available the first of the fiscal year, on July 1, the Bureau of Foreign and Domestic Commerce, Department of Commerce, has mapped out a tentative program for expanding its activities. Included in the increased appropriation, which is exclusive of the additional appropriation of $400,000 for the extensive inquiry being made into the sources of raw materials, upon which the United States is dependent for importations, is $100,000 additional for commodity divisions of the Bureau. The amount given to these divisions for the new fiscal year is $550,000. It is proposed to strengthen the work of the existing divisions and in this connection four new specialists will be sent to Europe. It is likely that among them will be a specialist in iron and steel. It is also proposed to send one or two industrial machinery experts to Europe, one of whom will be attached to the offices of the Bureau in China and Japan, while the other will go to India. In addition to sending these commodity experts abroad, it is proposed to increase the number of employees in some of the present divisions in Washington, including those on iron and steel.

A new work to be taken up for which $50,000 is available will relate to studies of economies in the distribution of raw materials and manufactures, to be under the direction of a domestic commerce division.

For the purpose of promoting commerce with Europe, $100,000 additional has been provided; $50,000 additional has been appropriated for the district offices in the United States; $33,850 additional for promoting commerce with the Far East; $29,350 additional for promoting commerce with South and Central America; $25,000 additional for commercial attachés; $25,000 for an investigation of foreign commercial regulations and restrictions and a new fund of $10,000 for a directory of foreign buyers.

In connection with the $100,000 additional for the promotion of commerce with Europe, a number of new trade commissioners, assistant trade commissioners, and clerks will be employed. It is proposed to establish a trade commissioner at The Hague. New trade commissioner offices also will be established in Venezuela and Colombia. The present fund for commercial attachés is $200,000. This sum has been increased $25,000 and most of the additional money will be for the purpose of employing clerical help at the offices of the present 10 commercial attachés.

The bureau heretofore has compiled a directory of foreign buyers out of its regular appropriations. A separate appropriation of $10,000 will make it possible to extend this work. Of the total funds of $2,776,110 available, beginning with the new fiscal year for the Bureau of Foreign and Domestic Commerce, will be $300,000 for customs statistics to carry on the foreign trade statistical work which was transferred from the Treasury Department to the Department of Commerce, last January.

### Decisions as to Tariff Rates

WASHINGTON, June 5.—The United States Board of General Appraisers has overruled the protest of P. McGettrick that iron wire rods in coils are entitled to free entry as horseshoe nail rods under paragraph 554 of the Underwood-Simmons act instead of being subject to a duty of 10 per cent under paragraph 113 of that act. The board held that it was shown that most of the material used for making horseshoe nails is rectangular in shape, whereas the rods in question are round and must be subjected to a flattening process. It was declared that there was no testimony showing these rods are commercially known and recognized in the trade as horseshoe nail rods.

The board also has overruled a protest of the John W. Sullivan Co., New York, in which it was claimed that Scotch marine boilers classified as manufactures of metal at 40 per cent ad valorem under paragraph 399 of the Fordney-McCumber law are dutiable at 15 per cent under paragraph 372 or entitled to free entry, probably as American goods returned or as ship's equipment. The particular provision of paragraph 372 which was relied upon is that for steam engines and steam locomotives, the contention being that the boilers in question are comprehended by that provision. This claim was held to be without merit. The regulations not having been complied with, according to the board, the claims for free entry as American goods returned, and as ship's equipment were overruled also.

### New Westinghouse Plant Opened

The new renewal parts of the Westinghouse Electric & Mfg. Co., Lang Avenue, Homewood, Pittsburgh, was formally opened May 25. It will specialize in the manufacture of renewal parts for motors and other apparatus already in service but which have become non-current and obsolete. The new works building, situated near the Homewood Station, Pennsylvania Railroad, and connected to that railroad by a siding, is a brick, cement and steel structure, 202 ft. long and 102 ft. wide. It is built on a plot of three acres, thus providing ample space for future expansion. The total floor space of the new works is 72,040 sq. ft. and window space is so arranged as to provide an abundance of daylight.

The manager of the plant is E. C. Brandt, formerly director of operations, Krantz Mfg. Co., Brooklyn, a Westinghouse subsidiary recently merged in the Electric Products Co., Mansfield, Ohio. W. C. Henderson, formerly general foreman railroad department, East Pittsburgh works, is superintendent. F. F. Rohrer will direct the sales activity and A. L. Broomall is renewal parts engineer.

# BUILDING TROUBLES

## Situation in New York Complicated by Strikes and Shortage of Bricks

NEW YORK, June 5.—Building in the Metropolitan district is still enmeshed in the labor controversy, the striking bricklayers holding out for a basic $12-day, while the builders sound a warning lest it become necessary to abandon all projects in the face of present conditions, which make no room for returns on money invested. The Mason Builders' Association, instead of immediate action on wages for 1924 or longer, has suggested that the present basic wage of $10 per day, plus $2 additional as recognition of the present emergency, continue as a temporary measure until next Jan. 1, and that a meeting of builders and bricklayers be set for Oct. 1 to consider the facts as they then stand for negotiating a new basic wage.

It was pointed out that the bricklayers' chances for an increase would be greatly enhanced by the fact that they would be at work rather than on strike; and, further, that employers will better know what can be done, since they will then be dealing with known facts instead of speculation as to the facts. Briefly, the position of the builders is that present conditions are filled with warning, and are altogether too uncertain to warrant an increase in the basic wage scale, but that the existing emergency should be recognized by the payment of extra compensation.

"It would be most unfortunate if the bricklayers were to insist upon remaining on strike, and then discover, as time goes on, that new buildings could not proceed on the present inflated basis," reads the statement of the builders, with regard to this phase.

A careful survey of work in progress in Greater New York by the Builders' Association reveals "That contractors may have to meet a similar situation as the 'peak' develops in carpentry work, plastering and other trades very shortly." After the bricklayers come the finishing trades and incidentally the mills producing materials. Employers believe that they can demonstrate to the strikers how unfit the time is for increasing the basic wage, and how persistence on the part of the strikers would bring hardships upon themselves, the employers and the public.

Upon the heels of this conflict comes a brick shortage which threatens further to impede building. Eight bargeloads, the last of the 1922 production, arrived last Monday. All reserves in the East are low and no relief is in sight. The net result is to bring labor face to face with an advancing period of idleness. Strikes at several large plants are responsible for the diminished output, as well as the coal miners' strike which delayed the kilns in starting the 1923 production.

"Construction Forecast," a four-page bulletin, will be published each week on Saturday and may be obtained by addressing E. L. Hoopingarner, who has been appointed to interpret the data collected. It is the purpose of the council to cooperate closely with trade journals in compiling statistics. A general summary of conditions will be submitted to daily papers for release on Monday of each week. The bulletin, while necessarily involving much statistical matter, will follow a style as simple and pointed as is consistent with its main function—to note construction under way and the conditions of labor, material and money under which it is done.

## Sand Blast Unit for Small Pieces

A barrel sand blast unit, integral with exhauster and cloth screen dust arrester and having direct-connected motor drive for both the barrel and exhauster, has been placed on the market by the Pangborn Corporation, Hagerstown, Md.

Sand Blast Unit for Plants Having Limited Production or Small Pieces to be Cleaned. Direct motor drive is a feature, barrel drive being shown in insert

Used initially in foundries, the barrels were of a size to accommodate castings but were not available for plants having limited production or small pieces to be cleaned. The unit illustrated is designed to accommodate with equal facility gray iron, malleable, steel and brass castings, forgings and stamped pieces.

Two sizes are available. The No. 1 barrel has a 20-in. diameter drum, 16 in. long, and with the arrester occupies floor space of 3 ft. 3 in. by 7 ft. The No. 2 barrel, having a drum 30 in. in diameter and 20 in. long, requires floor space of 3 ft. 7½ in. by 7 ft. 5½ in. The overall height of both units is 8 ft. 10 in. The units are shipped assembled and are made ready for operation simply by connecting the ventilating pipe and compressed air lines.

## Surplus Steel Exchange Organized

Robert D. McCarter and William L. Cooper of the firm of McCarter & Cooper, consulting engineers, New York; George E. Dix, formerly of the Midvale Steel & Ordnance Co. and the Consolidated Steel Corporation, and Edward Michaud, recently of the Consolidated Steel Corporation, have organized and incorporated the Surplus Steel Exchange, with offices at 7 Dey Street, New York. This organization has developed a new type of service for steel consumers. It will list excess stocks of steel which consumers wish to dispose of and will periodically publish and distribute such lists to users of similar steel products.

Mr. McCarter, who becomes president of the Surplus Steel Exchange, was for many years identified with the General Electric Co. and the Westinghouse companies. George E. Dix, vice-president, began his connection with the steel industry in 1907 with the Carnegie Steel Co. at the Waverly warehouse. He joined the sales organization of the Midvale Steel & Ordnance Co. in 1916 as assistant general manager of sales, and during the four years existence of the Consolidated Steel Corporation was assistant to the vice-president of that concern. Edward Michaud, secretary and general manager, was associated with Mr. Dix at the Consolidated Steel Corporation and previously had long experience with the Carnegie and Midvale companies. William L. Cooper, treasurer, was associated with the R. W. Hunt Co. for 15 years, having been European manager during a part of that time.

# Discusses Future of Engineering Societies

## American Engineering Federation, Engineering Foundation and Itself Considered by American Society of Mechanical Engineers at Montreal Meeting Last Week

FUTURE society activities were discussed at some length by the council of the American Society of Mechanical Engineers at the society's spring meeting at Montreal last week and the action taken was probably the most important development of the meeting, considering the furtherance of engineering through organization in its broadest terms. The chief items were recommendations on revising the rules of representation on the Engineering Foundation, a suggested departure in the make-up of the government of the Federated American Engineering Societies and a decision to restate the policy of the A. S. M. E. for the succeeding years in financial terms, largely as a guide to the officers and to avoid any drifting in respect to balancing the attainment of definite professional goals.

In passing it may be said that the consensus of opinion of the governing boards of the founder societies has been canvassed to the effect that had the Engineering Foundation done nothing else than finance the National Research Council when we were at war it proved itself an instrument of helpfulness beyond the hopes of Ambrose Swasey and the others who established it. Outstanding since then has been the extended and searching investigation so largely financed by it on the fatigue of metals.

Nine Past-Presidents Participated in the Montreal Meeting of the American Society of Mechanical Engineers. In the photograph are all of them but Dr. Ira N. Hollis. The members shown in the group photograph include those meeting with the council of the society.

Top row, from left to right: C. E. Gorton, New York; L. W. Wallace, secretary Federated American Engineering Societies; Charles Penrose, Philadelphia; C. C. Thomas, Los Angeles; Prof. A. G. Christie, Baltimore; Robert Sibley, San Francisco; L. P. Alford, New York; Earl F. Scott, Atlanta, and Robert B. Wolf, New York.

Second row, from left to right: Fred R. Low, nominee for president for 1924; A. L. Rice, Chicago; Walter S. Finlay, Jr., New York; H. H. Vaughan, chairman of the local committee of the Montreal meeting; Sherwood F. Jeter, Hartford; Henry M. Morris, Cincinnati; Erik Oberg, New York; Joseph W. Roe, New York; Roy V. Wright, New York; J. H. Herron, Cleveland, and George A. Orrok, New York.

Front row, from left to right: Secretary Calvin W. Rice, New York; Past-President Worcester R. Warner, Cleveland; Treasurer William H. Wiley, New York; Past-President Fred J. Miller, New York; Past-President Dexter S. Kimball, Ithaca, N. Y.; President John L. Harrington, Kansas City; Past-President John R. Freeman, Providence; Past-President James Hartness, Springfield, Vt.; Past-President D. S. Jacobus, New York; Past-President Charles T. Main, Boston, and Past-President Mortimer E. Cooley, Ann Arbor, Mich.

### Representation on Engineering Foundation

John R. Freeman, past president of both the mechanical and civil engineering societies, recommended that one of the members of the council or administrative board of a society who had been president or one of the vice-presidents be invariably the society's representative on the Engineering Foundation board, as a means of making the foundation more useful through close contact with his society. Dr. D. S. Jacobus, the society's representative, meeting the Freeman specification, indorsed the view. What is involved is merely a revising of the rules of organization of the Engineering Foundation and an agreement of the other so-called founder societies. As it is now men conspicuous for research attainments or capacity are selected without necessarily any responsibility or contact with the administrative bodies they represent.

### Crisis in Federated American Engineering Societies

The problem of the Federated American Engineering Societies was precipitated by the present inability of the American Society of Civil Engineers to become a member and by the decision of the American Institute of Mining and Metallurgical Engineers to withdraw on June 30. The situation is termed a crisis in the federation idea in so far as it is necessary that there be unified action of the four major societies in their relation to big engineering questions involving the engineering profession. As a result President Harrington was authorized to accept the invitation of the mining and civil engineering societies for a get-together conference to see how the broad question of joint action may best be met.

To accompany Mr. Harrington to this meeting the following were appointed: Past-President M. E. Cooley, president of the federation; Past-President Dexter S. Kimball, past-president of the federation; Past-President Fred J. Miller, A. S. M. E. delegate to the federation, and Vice-President L. P. Alford, vice-chairman of the A. S. M. E. delegation to the federation. The selec-

tion of this group, familiar and sympathetic with the federation, was regarded as safeguarding its continuation through an adjustment of details of administration and representation necessary to meet reasonable requirements of the civil and mining engineers.

One of the leading reasons advanced by the civil engineers in their published circular in connection with the taking of a referendum was a lack of democracy in the make-up of the body. They indicated that there should be a system of representation calculated to bring the governing bodies of the societies into more intimate contact with the F. A. E. S. than was the case. Another objection was the admission into the F. A. E. S. of local engineering societies whose standards of membership are not obviously so strictly observed as with the national organizations, and that the background of the representatives of the local society is not comparable with that of the leading men in a national society and also that the larger number of representatives from local societies gives a preponderance of votes to such societies.

As a means of solving the compromise, it was suggested that possibly some organization like that controlling affairs at Harvard University would serve. There a president and four or five fellows administer affairs. Corresponding to these there could be the president and one representative from each of the major societies. Then at Harvard is a board of overseers, comprising a large group to which it is a notably high honor to be elected; the overseers function solely as advisers to the president and the fellows. Likewise from all over the United States could representatives of local societies be selected to serve as an advisory board to the F. A. E. S. administrators. Thus at all times the president and the fellows could get the point of view of all sections while the actual results, it was contended, would be in keeping with high standards. Through some such reorganization, the hope was expressed, the engineering profession can be kept united in efforts to promote the public welfare.

### To Re-chart Financial Policy

What may be termed a re-charting of the course the society is to pursue came out of a long discussion in the council of the broad question of how to finance a professional society with the complementary question of how to administer the funds after arranging to get them. Some few years ago a taking of stock of the aims of the society resulted in a definite espousal of certain phases of industrial engineering and apparently, now from within the council, it has seemed advisable again to survey the avenues which may be traveled. Several members expressed themselves as believing in a writing down of a definite program for the benefit of the officers as they take up their duties; that if there is not a worked out plan in consonance with the current needs of industry, the society's progress will be halting and the consummation of the desired end checked by a president's taking up his work without a chart to direct him where the members should be led.

Dexter S. Kimball, dean of the college of engineering, Cornell University, was made chairman of a committee on financial policy as a result of the discussion. The investigation will cover the essentials of society work and then those things which it is obviously desirable to do if it is possible so to arrange. Calvin W. Rice emphasized that the society is living within its income, but that there are ever-increasing demands from members for additional service, and yet in the face of increasing costs the dues have remained without change.

### General Character of Technical Contributions

The society meeting was the regular annual spring affair. It was held at the Mount Royal Hotel, Montreal, which proved well adapted to accommodate several simultaneous general sessions and committee conferences. In metal working lines the technical contributions related largely to the paper and pulp industry in recognition of the large part paper-making has in the industrial activity of that part of the American continent. Both the management and the machine shop practice sessions were somewhat special in this respect. The power sessions were devoted in part to the problems of waterpower developments, so conspicuous in the general region, and a session on port development covered harbor design and material handling as affecting pier design with one of the excursions a trip around the Montreal harbor. The railroad session had to do with car design and to this was tied a visit to the Angus shops of the Canadian Pacific Railroad, which provided a special train for the purpose. Another notable plant visitation included an inspection of the machine shops and foundry of the Dominion Engineering Works constructed for the fabrication of the Quebec bridge and now manufacturing hydraulic turbines and paper-making machinery on a large scale.

### Proposed Machine Shop Practice Activities

A suggestion of vital interest to those engaged in metal working was made by a special committee on plan and scope of the machine shop practice division. It was that machine shop practice papers for the annual and spring meetings should be of a fundamental or research nature. In general, said the committee, they will deal with machine shop processes applicable to machine shops everywhere, rather than to those in a particular industry. "As such papers cannot be obtained on the spur of the moment or even with several months' notice, the planning sub-committee should lay down a ten-year plan under which the various shop processes can be taken up. By laying down plans thus far ahead it will be possible for the sub-committee to keep in touch with research and experimental work of various kinds and arrange, through the meetings and papers committee, to have it presented before a meeting of the society when its development is sufficiently advanced.

"It was also felt that, on the contrary, papers to be presented at the regional and the local section meetings, where machine shop practice is the general topic, should probably be of a more industrial type. For instance, papers describing methods of processes in machine tool building shops would be of interest to the Cincinnati section, whereas papers on subjects connected with textile machinery would interest sections in the textile districts of New England or the South."

It was also suggested that in those localities where several plants are situated which produce similar products, and which thus have similar production problems, groups be organized to work up and present discussions on their common problems. "A large amount of valuable information and data is unavailable to the engineering profession at large because those holding such material have never made it public. It is realized that much of it has direct commercial value, and the organization whose property it is does not wish to make a present of it to competitors. On the other hand, such competitors usually have data of their own along very similar lines. In such cases arrangements might be made so that the presentation of such similar data from several organizations would be made at the same time, thus making it a matter of exchange of information which should be to the advantage of all parties. Even eliminating such confidential information, there are a large number of every-day shop practices which could be discussed to advantage by a group representing different organizations engaged in similar work."

### Officers Nominated for 1924

On the last day of the meeting the nominating committee determined on its list of candidates for election in the coming months and to take office immediately following the annual meeting in December for the ensuing year. The nominations are as follows:

For president, Fred R. Low, editor *Power*, New York.

For vice-presidents: George I. Rockwood, Rockwood Sprinkler Co., Worcester, Mass.; Morris L. Cooke, consulting engineer, Philadelphia; W. J. Sando, consulting engineer, Milwaukee.

For managers, E. O. Eastwood, professor of mechanical engineering, University of Washington, Seattle; F. A. Scott, vice-president Warner & Swasey Co., Cleveland; E. R. Fish, vice-president Heine Boiler Co., St. Louis.

For delegates to the American Engineering Coun-

cil of the Federated American Engineering Societies: Dexter S. Kimball, dean of college of engineering, Cornell University; William Schwanhausser, chief engineer Worthington Pump & Machinery Corporation, New York; Dr. S. W. Stratton, president Massachusetts Institute of Technology, Cambridge, Mass.; P. F. Walker, dean of engineering, University of Kansas, Lawrence, Kan.; F. X. Copeland, president Sullivan Machinery Co., Chicago; J. G. Faig, president Ohio Mechanics' Institute, Cincinnati; Ralph E. Flanders, manager Jones & Lamson Machine Co., Springfield, Vt.; C. C. Thomas, Dwight P. Robinson & Co., Inc., Los Angeles; William B. Powell, Buffalo.

For treasurer (renominated), William H. Wiley, John Wiley & Sons, New York.

H. H. Vaughan, consulting engineer, Montreal, was chairman of the local committee which helped through the entertainment and plant visitations to make the Montreal meeting an outstanding one, aside from its attracting the largest attendance for a number of years. The council, which was entertained by the council of the Engineering Institute of Canada on the first day of the meeting, had both its Pacific Coast members present, and no less than nine past presidents attended the spring meeting.

Few of the visitors expected to see such large machinery as forms the equipment of the Dominion Engineering Works, Ltd. Among others seen in operation were a Sellers vertical boring and turning mill, with a capacity to take work 35 ft. in diameter and having 18 ft. under the cross rail, a Niles boring and turning mill of 18-ft. diameter capacity and a 200-ton horizontal press. The foundry has three cupolas, 36, 54 and 84 in. in inside diameter and water-tight concrete pits for molding large castings and special pits for rolls and dryers.

Besides its output of paper-making machinery, the company was building a sintering machine and a large number of hydraulic turbines. Its contracts include four 30,000-hp. I. P. Morris turbines for the St. Maurice Power Co. at La Gabelle, Que., four 11,300-hp. turbines for the Montreal Light, Heat & Power Co. and three 58,000-hp. turbines for the Hydroelectric Power Commission of Ontario, besides some 22 turbines and valves and other equipment, mostly of smaller power ratings.

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# 120-IN. MOTOR-DRIVEN PLATE MILL

## First Unit of This Type in United States Operates Efficiently

BY W. KENNEDY*

OUR new 120-in. motor-driven plate mill is the first electrically driven plate mill in this country for rolling steel plate directly from the ingot. There has been installed at the Dominion Iron & Steel Co. plant in Canada a 110-in. mill for the same service, but nothing of this kind has been operated before in the United States.

The mill is driven by a 4000 hp., 35 deg. Cent. rise, slip-ring induction motor, 6600 volts, 3 phase, 60 cycle, having a synchronous speed of 200 r.p.m. The usual permanent secondary resistance is employed, with a notch-back regulator for increasing the amount of resistance on heavy loads. The motor is furnished with a 73,000-lb. cast steel flywheel, 204 in. in diameter, which is mounted directly on the rotor shaft and the wheel and rotor are supported by two bearings only. The motor unit is coupled directly to the reduction gear through a flexible coupling. The reduction gear set has a ratio of 20 to 51 and the face of the gears is 48 in. The entire set runs in a continuous bath of oil. From the gear set the power is transmitted to the usual 3-high pinion stand of cast steel teeth and thence to the mill, which is of the usual 3-high type with tilting tables.

From the above it will be seen that the reduction gear set takes the entire shock of rolling, since the flywheel is mounted directly on the rotor shaft.

The operation of the entire equipment has been exceptionally satisfactory and very good results as to power consumption have been obtained. Most of the work carries an exceptionally high elongation, running anywhere from 20 to 70 on an average of approximately 50. Under these circumstances the average power consumption for a month has been running 48 kw. per ton charged. I do not have any figures from other mills with which to compare this power consumption, but it is considerably lower than was originally expected.

It is interesting to note the comparison between this mill and a steam driven mill, operating in the same plant. While the steam driven mill is larger, being 160 in., yet, due to the line of work rolled at present, a fair comparison of the work between the two mills is possible. The no-load rolling speed of the electric mill is 472 ft. per min., while the steam mill runs at 422 ft. per min., which means that the electric mill is only 12 per cent faster running than the steam mill.

However, in actual operation it is evident that the actual rolling speed obtained by the electric mill is considerably faster than the steam mill. This is due to the fact that the electric mill slows down but 10 or 15 per cent even on heavy drafts, while the steam mill will drop as much as 50 per cent. In one case on the electric mill, where too heavy a draft was taken, the rolls actually slipped on the ingot; but it was possible to raise the top roll quickly and allow the ingot to go through, and it was finished without any loss. This would have been practically impossible with the steam mill as, under the same conditions, probably it would have stalled, resulting in the loss of the ingot.

At present the motor, and in fact the entire plant, when the electric mill is operating, is driven by one 6250-kva., 3600-r.p.m. steam turbine. The rolling peaks on the motor run anywhere from 2000 to 5000 or 6000 kw., which makes an extremely hard condition for the operation of the turbine governor. The speed of the turbine, however, varies but slightly and the entire operation of the whole equipment, including the governor, has been more than satisfactory.

There has been a notable decrease in steam consumption, although no accurate figures are yet available. It has been found, however, possible to reduce the number of boilers in operation, due to the better steam economy of the steam turbine as against the reciprocating engine running non-condensing. When the steam mill is operating, the exhaust steam from the engine is used to run a 2500-kva. steam turbine which is used for the usual power supply to the plant. However, the load on this turbine is not nearly sufficient to take the entire amount of exhaust steam, so that part of the above mentioned steam economy with the electric mill is due to the fact that there is practically no waste of exhaust steam.

*Operating engineer, Worth Steel Co., Claymont, Del. This is an abstract of a paper read before the Association of Iron and Steel Electrical Engineers.

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## Study of Quenching Media

The object of a new investigation started by the Bureau of Standards during the past month is to obtain more complete information than is now available on the cooling properties of the ordinary quenching liquids used in the heat treatment of steel. It is also hoped that some information bearing on the subject of dimensional changes, occurring during the hardening of steel, will also be obtained. The preliminary work has been devoted largely to setting up the necessary apparatus, but a few preliminary experiments have been carried out on quenching nickel cylinders in water with very satisfactory results. As the preliminary work is now practically completed, it is hoped that considerable progress will be made on the main investigation during the next few weeks.

# REGENERATIVE REVERSING VALVE

## Six-Way Self-Contained Unit Performs the Whole Operation in 10 Sec.—Avoids Gas Leak During Reversal

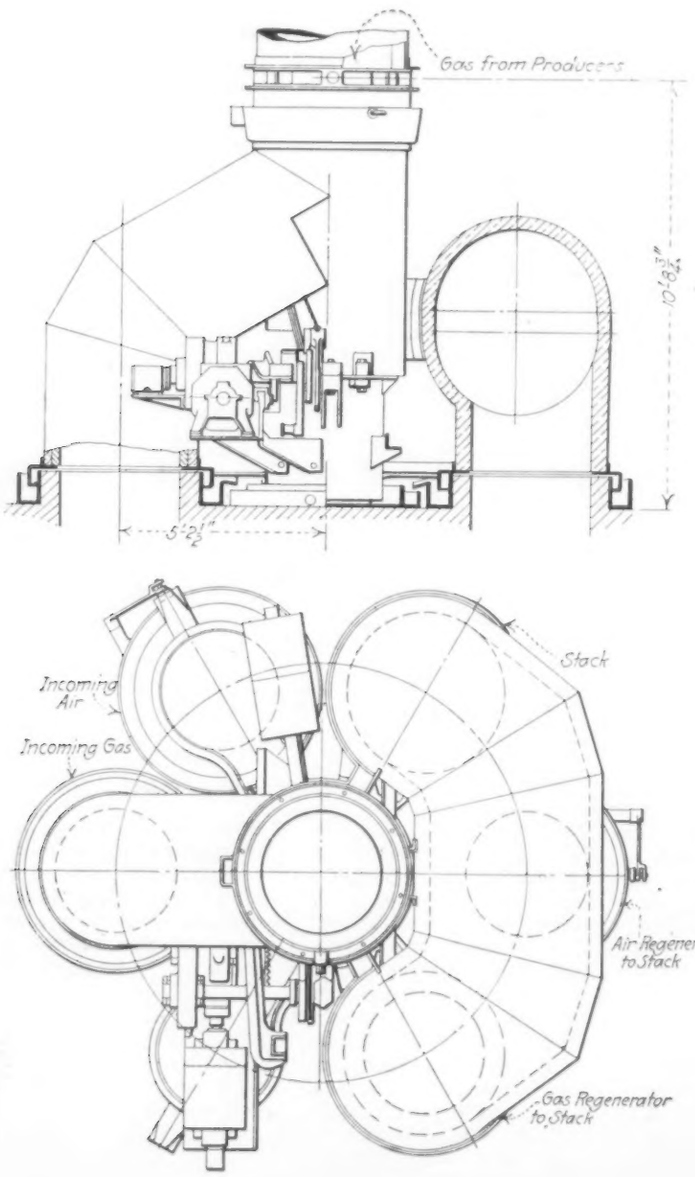
A six-way reversing valve for open-hearth and other regenerative furnaces, that represents a marked departure in design from valves now used for the reversal of the flow of gases through furnaces of this type, has been brought out by Willis McKee, Cleveland. An outstanding feature is that gas cannot leak past the valve to the stack during reversal, as there is no connection between the gas main and stack, and a shut-off valve is provided for the gas, which must be closed before the valve can be reversed. Another feature is that it is a self-contained valve, the one self-contained unit reversing both the air and the gas. A third important feature is that the valve can be operated by hand, in case trouble with the operating mechanism makes this necessary.

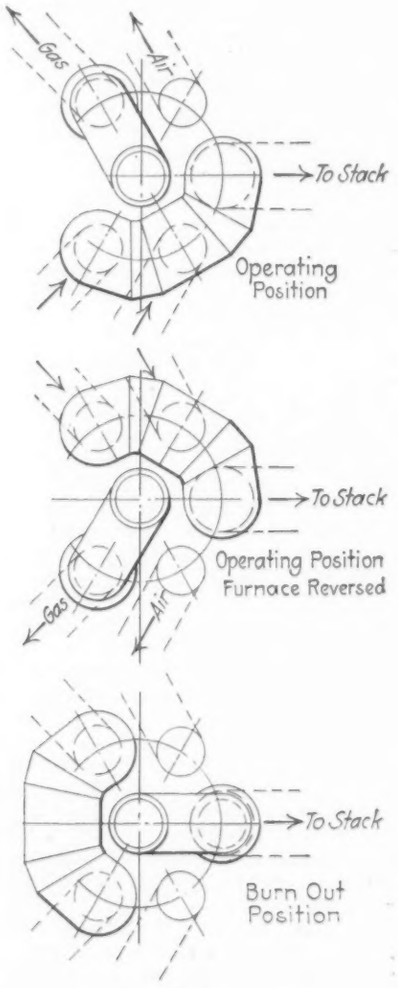
There are five outlets in the brickwork, grouped about a common center. Two of these outlets lead to the air regenerators, two to the gas regenerators and one to the stack. The one gas main is an overhead main terminating at a point over the center about which the terminals in the brickwork are placed.

On the pintle casting is mounted a housing which supports a gas tube lined with fire brick and insulating brick, and another tube with three terminals lined with insulating brick, which conducts the products of combustion to the stack. These tubes are so mounted that normally the gas tube is connected through a water seal with one of the gas regenerators, and both of the regenerators on the opposite end of the furnace are connected to the stack by the other tube. The amount of air admitted to the air regenerator is regulated by a damper over the air terminal, controlled from the operating floor above.

There is a gas regulating valve of the butterfly or mushroom type on the gas main, just above the six-way valve. The latter valve and its regulating valve are so interlocked that, when it is desired to reverse the valve, it is necessary to close the regulating valve before the motor can be started, and after the motor is started it is impossible to open the regulating valve until the motor is stopped and the six-way valve is properly seated in the seal pans. The entire weight of the moving parts is supported on a knife bearing in the center of the valve and rests on a ball bearing. The weight of the lifting parts is counterbalanced to within a few hundred pounds. The unbalanced weight is supported by a roller against a cam, that is provided for raising the valve from the bottom seal pans and lowering it into the pans during reversal.

The main shaft makes one revolution to reverse the valve. In the first quarter turn of the shaft the valve is raised vertically clear of the bottom seal pans by the cam backing off the roller. At this point the crank pin engages the connecting rod and rotates the valve 120 deg., starting from a dead center and stopping on

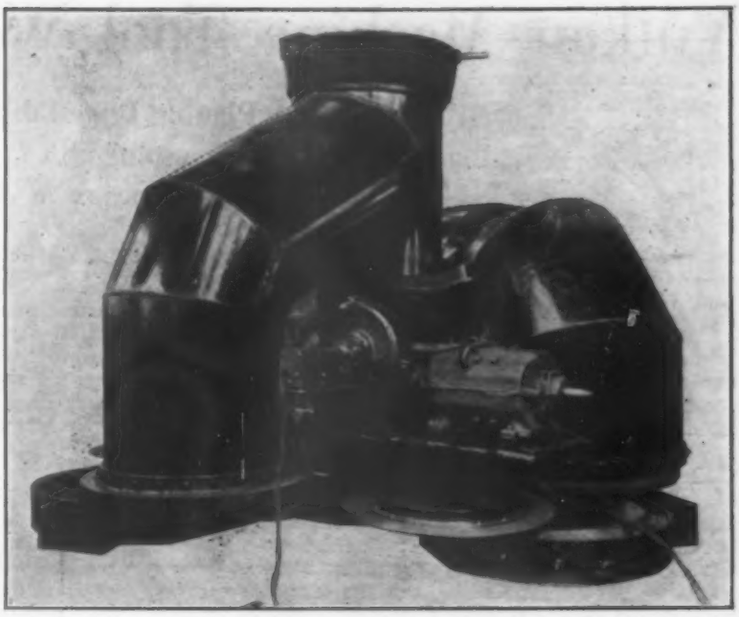



At Left, the Detail View Shows Location of Elements of Valve for Operating. The three outline views above give the three normal positions of the elements—operation on either end of the furnace and burning out the main

a dead center. During the last quarter turn of the shaft the cam allows the valve to lower vertically into the seal pans and the motor is stopped by the limit switch. The cam has a circular section which allows for a reasonable over-travel of the valve and, should the limit switch for any reason fail to function, the valve cannot be damaged. In operation the valve can be reversed in 10 sec. To insure that the valve will always remain in the same position when not being rotated a locking pin is provided which locks the rack and the main housing.

While the valve is so built that the center of gravity is approximately in the center line of the ball race, three upper and three lower bronze bearings are provided in the housing casting to take any side thrust from the pintle bearing. These bearings, as well as the other principal bearings, are provided with graphite inserts to insure proper lubrication at all times. With its ball bearing support and counter weighting the valve is constructed so that, in case of mechanical or electrical trouble, a helper can put a bar in a hole in the counterweights, pull it down and reverse the valve.



As Appears Above, the Valve and all Its Mechanism Form a Self-Contained Unit of Great Compactness

In burning out the gas main, the valve is swung by hand so that the gas tube connects directly to the stack and the main can be burned out through the valve. When small headroom is available the design can be modified so as to make all outlets from below.

Cut gears are provided and the worm, of nickel steel hardened and ground, runs in oil on ball bearings. The seal pans, seal rings, pintle casting, gear housing, gears and connecting rods are steel castings of heavy construction so as to minimize repairs. The control mechanism and limit switch are of the Cutler-Hammer design. Other advantages claimed for the valve are the following:

It is impossible to have an internal leak. There are no parts embedded in the brickwork or under ground. There is no plate work in contact with water, thus eliminating troubles from corrosion. All seal pans, being external, can be cleaned during operation. The gas passages through the valve are not contracted, so that excessive resistance to the passage of the gases is avoided. No part of the valve is suspended from the charging platform and there are no cables or sheave wheels used in reversing the valve. The room back of the regenerators is left comparatively unobstructed.

Willis McKee, who has designed the valve, has been connected with Arthur G. McKee & Co., engineers. He has opened an office as engineer and contractor in the office building of Arthur G. McKee & Co., 2422 Euclid Avenue, Cleveland. Orders for the new type of valve have been placed by the Bethlehem Steel Co., Wheeling Steel Corporation and Wisconsin Steel Works.

## BANKING A BLAST FURNACE

### A New Method Tried Out in Belgium—Furnace Banked 18 Months

An interesting method for banking a blast furnace is described in the *Revue Universelle des Mines*, Nov. 15, 1922, page 317. It is a short article by A. Cousin, blast furnace superintendent at the John Cockerill plant near Liège in Belgium. The method has just been tried there by banking a furnace for 18 months. The only preparation given the furnace was to reduce the ore in the charge by one-fifth, and no extra coke was given. The ease with which the furnace was put back in operation definitely proved that the method was good, and it was the first time the method could be tried properly since it was worked out several years ago.

All blast furnace men know how difficult it is to prevent air entering a furnace when it is banked. The interior heat brings about a draft which draws air through the joints and invisible cracks in the brickwork and, whatever precautions are taken, a notable part of the coke is slowly consumed, which is a total loss and is very detrimental to an easy starting up when blast is put on again.

In order to suppress this combustion it is sufficient, when a furnace is banked, to maintain the gas downcomers in connection with the gas mains of a furnace still in service. The pressure of this gas naturally opposes any entrance of air. The operation is easily carried out, because it is not often that all the furnaces of a plant are stopped at the same time, and those remaining in blast give the necessary pressure of gas.

In order to avoid losses of gas, which may be considerable, not only must the tuyeres be stopped up but the brickwork should be repointed and given a wash of clay, as in the usual European method of banking. This not only prevents entry of air but also prevents gas passing from the interior to the outside. The pressure of gas, which is very weak, soon ceases to be necessary because, as no combustion is possible, the furnace cools rapidly and the trouble due to draught is overcome.

The quenching of the coke is complete, and when the blast is again put on, there is not heat enough to start combustion. This causes no trouble if hot blast is employed at 800 deg. C. or more, which is usually the case, because the coke takes fire itself. In case the hot blast does not have enough temperature, there is no difficulty in opening the tapping hole quite wide and introducing shavings and wood both there and at the slag tapping hole and so starting combustion.

The blast furnace, which was banked at the Cockerill plant for 18 months, gave its first tap six hours after the blast was put on, and both the iron and slag were normal. G. B. W.

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Irwin Gas Coal Co., Greensburg, Pa., the Amend Coal Co., the Salem Gas Coal Co. and the Nineveh Coal Co. have been combined under the name of the Irwin Gas Coal Co., with a capital of $3,000,000. The new company, of which R. H. Jamison, Greensburg, Pa., is president, has six mines with a daily capacity of 4000 tons, four of the operations being at Export, Pa., and one each at Seward and Uniontown, Pa.

# Vulkan Machine Tool Works of Vienna

## Special Machines for Planing Plate Edges; Turning Rolls; Planing Rails and Stamping Out Coins—General Machine-Tool Situation in Austria

BY CAPT. GODFREY L. CARDEN

THE most important machine-tool operation in Austria is the Vulkan Works of Vienna; a branch plant is located at Budapest. I have observed Vulkan tools in foreign countries to a limited extent, but Vulkan did very little export business before the war, since the demands of the home market were sufficiently great to absorb the greater part of the output.

In pre-war days Vulkan, in common with other Austrian works, enjoyed practically a subsidy, inasmuch as all Government plants in what was formerly Austria-Hungary were called upon to make limited expenditures in the home market. The majority of Austrian plants under Government control felt it incumbent to purchase at least one-third of the machine-tool equipment from home producers. Then, as now, Vulkan was the only Austrian works building a general line of heavy tools.

I reported on the Vulkan works in 1909 for the Department of Commerce at Washington and, with the impressions of that period in mind, recently revisited the works and again met Director Fluss and Chief Engineer Heinrich Ast, both of whom I had known in connection with my first visit. The change in conditions was very marked: at present there is little work in hand, with no prospect of better times until the general economic situation in Europe rights itself.

The Vulkan shops maintain on the payrolls about 800 men. This is considerably less than in war times, when Vulkan was working intensively, but it indicates that these works are still a long way from shutting down. Austrian shops under pre-war conditions could generally keep busy within their own territory, but under present circumstances the Austrian works are seeking trade opportunities in the countries to the eastward, especially Roumania, Bessarabia, Bulgaria and in Jugo-Slavia. The Vulkan shops in this connection are taking advantage of orders from locomotive shops and, while the business is understood to be not large, it serves to keep the Vienna plant going.

In pre-war days Vulkan made special efforts along the line of the larger sizes of machine tools. Special stress was laid on heavy planers, for the Vienna firm did not hesitate to go in for large dimensions, and had actually made planers up to 18 ft. width. This special size was for handling armor plate. In answer to my inquiry for new machine tools for which Vulkan claimed special merit now, Mr. Ast called attention to the plate-edge planing machine, a double roll-turning lathe, a rail planing machine and a coining machine.

### Plate Edge Planing Machine

The plate edge planing machine is designed for planing plates of 12 meters (39 ft.) length, or even greater, with resetting of the work. The cutting speed is 200 mm. (7⅞ in.) per second. The drive is by a 20-hp. electric motor. The planer works both during the forward and the backward travel. The carriage can be displaced on the prismatic bed and the tool holder swiveled 180 deg. The length of stroke is limited by adjustable stops, which also initiates the automatic reversal of motion and functions the automatic swiveling of the tool holder. The carriage can be adjusted by hand and the tool holder set at an angle to permit planing the beveled edges.

The carriage carries an operator's platform, whence he can start, stop and reverse the machine. The lead screw for the carriage is driven by a 20-hp. motor actuating multiple back gearing. An electro-magnetic reversing gear is a part of the drive equipment. The plates are held down by hydraulic pressure stamps and intermediate screws. The pressure stamps may be disengaged separately or together. A cast iron beam connected with the machine and fitted with resting feet serves as support for the plates. These resting feet have T-shaped slots cast in, into which long angle bars may be put as an additional support to the plate.

### Double Roll Turning Lathe

The Vulkan double roll turning lathe has a height of centers of 500 mm. (19⅝ in. half-swing) and distance between centers on both sides 2400 mm. (8 ft.). When the tailstock is taken off, this distance between centers is increased to 5800 mm. (19 ft.) The headstocks are designed for direct electric drive and have eight different speeds, which are readily adjusted by sliding gears.

The tailstocks are equipped with revolving face plates driven from a shaft and having a gearing which may be engaged and disengaged. The four tool carriages are equipped to take broad turning tools. The feed of the carriages is operated by eccentric disks. The machine permits of the turning of two short rolls simultaneously, or one long roll of 5800 mm. maximum length when one tailstock is taken off.

### Rail Planing Machine

The Vulkan rail planing machine, driven by a 40-hp. motor, will plane in lengths up to 6000 mm. (19 ft. 8 in.) and in width to 1500 mm. (4 ft. 11 in.) Two cutting speeds are provided, of 120 and 180 mm. (4¾ and 7 in.) per second respectively. The effective power at the table is 15,000 kg. (33,000 lb.) Forward and backward motion is effected by a rack into which engages a wheel. The cross rail has vertical power adjustment.

The two tool heads can be fed automatically, vertically and inclined, and can be moved by hand. The feed of the tool heads can be reversed or disengaged while the machine is working, and also admits of change in amount. The reversal of the table motion is effected by adjustable stops, which are fixed by screws, corresponding to the length to be planed. These stops work an electric change-over switch which influences the electro-magnetic coupling. Three tool heads are supplied.

### Coining Machine

The Vulkan coining machine is built in four sizes, for stamping out silver coins of 25, 31, 38 and 45 mm. (1, 1.22, 1.5 and 1.77 in.) diameter. The coining matrix, very accurately guided, is readjustable in height by screw and wedge. It may be swung out for the setting of the disks or for examining them. The feed of the coin blanks to the coining die, and the removal of the coined plates, are effected automatically. The machine is driven by fast and loose pulleys and heavy fly wheel, which can be readily uncoupled. The machine is stopped by a tread brake.

### Machine Tool Trade

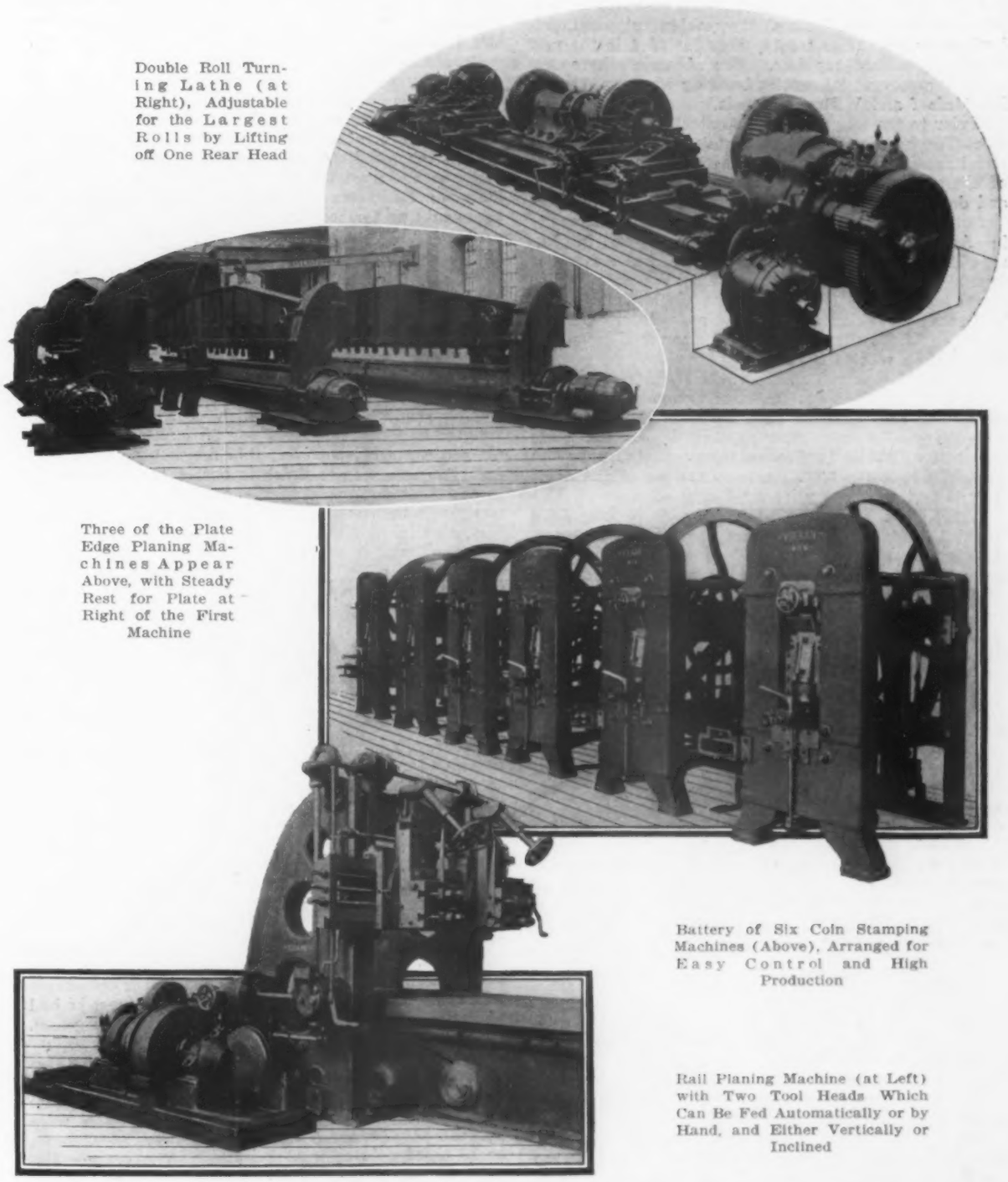
Prior to the war shops in Austria-Hungary imported many machine tools. Germany was a large seller, and the best grades of American machine tools were finding a market in that territory. As a rule American machines were purchased because of price. The State railroad shops at Vienna had long been purchasers of American machines and, up to the opening of the war, the Floridsdorf locomotive works had included some of the latest types of American machine tools. Practically no American machines are going into Austria today. The local shops can take care of

most of the home business, and the rates quoted by German houses in the effort to regain pre-war trade has enabled the latter to fill up any requirements remaining over. Just now manufacturing in all lines is at low ebb in Austria. The Austrian machine tool works have been able to make some sales in Poland, but for the most part the tools in demand have been for requirements of works engaged in the repairing of locomotives.

The locomotive shops at Floridsdorf, Wiener-Neustadt and the State locomotive shops at Vienna are all working, but on reduced time. The Floridsdorf and State works are building locomotives for Roumania and for the Austrian State Railways. A few locomotives have been built for Poland. At Floridsdorf they are building electric locomotives for the Austrian railroads in the Tyrol. On the whole, though, the shop activities at Vienna are far below pre-war conditions and until business revives there will be little or no demand for newer installations.

Bohemia, which once constituted the principal machinery manufacturing portion of Austria-Hungary, is just now in the doldrums, so far as business activity is concerned. This country draws very little on Vienna machine tool shops now and has recourse, despite all past prejudices to German machines. The situation with reference to Bohemia will be described separately but, in passing, it may be said that so far as adding to manufacturing strength, the political division which has occurred as a result of the war has accomplished nothing. Bohemian machinery works which before the war had full access to Austria proper, and enjoyed privileges which made possible large exports of Bohemian machinery, are now barely able to maintain themselves. At the same time the Austrian machine tool works have lost the Bohemian market. Between the two countries there now exist customs barriers.

Austrian machine tool works recognize, as do other machinery lines, that the future trade for Austria,



Double Roll Turning Lathe (at Right), Adjustable for the Largest Rolls by Lifting off One Rear Head

Three of the Plate Edge Planing Machines Appear Above, with Steady Rest for Plate at Right of the First Machine

Battery of Six Coin Stamping Machines (Above), Arranged for Easy Control and High Production

Rail Planing Machine (at Left) with Two Tool Heads Which Can Be Fed Automatically or by Hand, and Either Vertically or Inclined

when it does come, will be in the direction of the Near East and Russia.

### Austrian Locomotive Works Activities

The state of the trade among the locomotive works in Austria is always, it is said, a good index of manufacturing business in that territory. There are a number of important iron and steel plants still left in Austria proper but the bulk of the machinery works, following the Versailles treaty, were included in the new Czecho-Slovakian republic. For Austria there remained important locomotive building works in Vienna, Floridsdorf and Wiener-Neustadt.

Prior to the war the iron and steel works of Witkowitz, Trzynietz and Resicza supplied most of the material used in the Austrian locomotive shops. All three of these plants have now been cut off from Austria and dependence today is largely on the steel works at Ternitz near Neustadt. There is no lack of iron ore in Austria — probably the best iron ore in Europe is to be found in Austrian mines, but Austria is dependent today on the outside for her coke, which comes now largely from Witkowitz (in Moravia, which is Czecho-Slovakian territory) and from German sources. Witkowitz was to the former dual-monarchy what Krupp was to Germany.

In 1909 I reported on the various Austrian locomotive works for the Department of Commerce in Washington and only recently have revisited these shops to note changes, if any, since pre-war days. The State Locomotive Works in Vienna is one of the oldest in Austria. It is a private company and its official name is Privilegirte Oesterreichisch-Ungarische.

This plant was founded by the Scotsman, John Haswell, in 1838. Haswell was a genius in his way. He brought with him a fine technical training from the university of Glasgow and many of his designs continue in force almost as originally planned. Haswell was a good many years ahead of his time but he had the ability and power to force his ideas into being. His personality put a hall mark on Austrian locomotive designing which has given the Austrian school, as it is termed, a preeminent position in the world. In more recent years the Austrian engineer, Charles Goldsdorf, attached to the official railroad administration, has been recognized as perhaps the first locomotive engineer designer in Europe, and Goldsdorf's ideas, either in whole or modified, are generally found throughout the world today.

In 1909 the State Locomotive Works was employing 1500 men on a 53-hr. per week basis. This number was increased gradually until a force of 1705 was the average number in 1921. For 1922, under the spur of retrenchment, which is very general throughout Austria, this force was cut down to 1137 men. The working time now varies between 40 and 48 hr. per week.

### New Conditions After the War

It was interesting to hear both directors and engineers of this distinguished plant describe the difficulties under which they had labored in consequence of the division of territories resulting from the war. Customs barriers have necessitated establishing new sources of supply and this has also resulted in considerable change in clientele. The Austrians always did export a considerable number of locomotives. The main trade in pre-war days was to the eastward, and Russia was an important customer. The dual monarchy also absorbed a great number of the locomotives built within its confines, but today it is necessary for these Austrian works to seek their principal business abroad.

Both Germany and Austria have found the French good customers for steel and iron products. The French have been large buyers of German machine tools. The Vulcan Machine Tool Works of Vienna has also sold heavy machines to France, and the State Locomotive Works to date has delivered 50 heavy freight locomotives of the ten-wheel type to the Paris-Lyon-Mediterranean Railroad. The Polish Railroad has taken 65 of this same type of locomotive from the works.

After the violent destruction of the old monarchy, as one of the directors put it, the greatest difficulty was securing coal and coke, and it was only with the greatest difficulty, he added, that shop efficiency was restored. Gradually, however, conditions became better and last year the works delivered approximately 100 locomotives. This number does not sound large when compared with American output, nor is it large when compared with the outputs of the new locomotive department at Krupp's, where, on an average, one locomotive per day is completed. The greater part of the locomotives built last year in the Vienna shops were sold to customers in France or for service on the State railroads in Poland and Roumania.

Incidentally, the Roumanian business very generally is spoken of in Central Europe as not being wholly satisfactory. The criticism is that there are too frequent changes in bureau authorities and commitments are not always lived up to by successors in office. I found in one Austrian works a number of locomotives built for Roumania which were being held up until payment was forthcoming.

### Fine Finish on Products

The engines built at the State Locomotive Works are of Goldsdorf design mostly and in addition are built locomotives of the American Atlantic and Prairie types. The engines turned out in pre-war days were very finely finished and the engine work was of an exacting character. There seems to be no falling off in the machining work of today and there are now locomotives ready for delivery which we Americans would imagine had been prepared for an exposition display. On the contrary, however, this fine engine work and excessive attention to finish is one of the peculiarities in the trade and explains one of the difficulties Americans experience in export when competing against European locomotives.

These engines are built with copper fireboxes and copper stay bolts. Super-heating appears to be the rule, and attention is paid to many refinements which we, in our intensive demand for haulage, are not so mindful about. The plant has brought out a new feedwater heater of the Dabeg type. The locomotives here are constructed in series of 25 and are equipped with Lentz valve gear. These valves are made of one piece, light in weight but solid and strong. They afford considerable weight economy in comparison with other valve gears and the coal economy showing, I am given to understand, is very good.

The State Locomotive Works is producing in its own shops all cast iron parts and forgings, while essential parts such as axles, tires, steel castings and sheet iron now come from Ternitz. Boiler sheet iron comes from the Austrian-Alpine Erecting Co. in Zeltweg and cast iron from the Donawitz Works of the same company. Both plants are located in Steiermark (Styria). With the exception of boiler tubes, the Austrian iron and steel works are able to make deliveries in ample quantities, including sheet iron, forgings, axles, tires and steel castings as required. While coal is obtainable in Austria for ordinary purposes, recourse must be had to Germany and Czecho-Slovakia for free burning coal.

### Typical Wages Paid

The general state of the Austrian metal working trade is indicated by the rate of wages paid at the State Locomotive Works. These wages for mechanics vary between 240,000 and 500,000 crowns (say, $3.50 to $7, or 16 to 35 gold crowns) per week. The present kilo price for locomotives varies between 20,000 and 25,000 Austrian crowns. This price, however, is largely affected by the flucutations in the market. During the war the State works brought out the 2D locomotive, which has a speed of nearly 130 km. (80 miles) per hr. It is the most powerful locomotive in Austria and its boiler position is the highest of any locomotive in Europe.

Just now the situation in Austria is improved by reason of the Ruhr occupancy. The shutting off of materials to German plants has enabled Austrian works to emphasize their ability to guarantee deliveries and Austrian locomotive shops are receiving orders which in the ordinary course would have gone to German works. The same is true with respect to other metal products plants and, in general, Austrian shops are

receiving inquiries from sources heretofore regarded as under control of the Germans.

### Austria Looking to the East

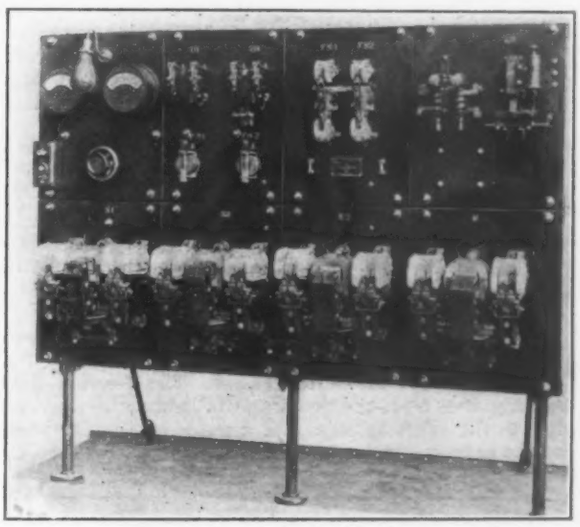
The natural field of exploitation for Austrian industries is the region to the eastward. The Russian territory was an important field in pre-war days for Austrian steel equipment and that territory, when again opened, may be expected to draw on Austrian supplies. The Austrians are now working in harmony with the Turks and Danube River steamship interests are allied with the projected coastal lines of the Turkish Government. As conditions tend to normalize the Austrian works, it is confidently believed, will find an increase in business through the Balkan peninsula and in Jugo-Slavia, Roumania and the Baltic states.

The general tone of the financial situation in Austria is improving. The works are carrying on under the most rigid economy. The guiding motive from the first was to hold organizations together against the time when business would revive. This enforced economy has been a strong factor in carrying the country through, and a general feeling abounds that the worst of the situation has been passed over. There is little or no communistic sentiment in evidence. The Austrians are working along sane and sure lines and conditions are fast approaching a stage where financial encouragement can be extended to many plants under a fair degree of business risk. With good harvests this year to the eastward, the prospects are encouraging.

## Automatic Starters for Synchronous Motors

Automatic control for starting is extending the use of synchronous motors because the manual starting is apparently a complicated procedure which takes considerable time and effort. The automatic starting panel illustrated, a recent design of the Cutler-Hammer Mfg. Co., Milwaukee, for use with a 440-volt motor, is said to make the starting of a synchronous motor as simple as for any other type, a push button station being the only part which the attendant need operate.

The majority of synchronous motors are supplied with squirrel cage windings for starting purposes, and



Automatic Starting Panel for Synchronous Motors. The push button at the upper left is the only part of the apparatus that the attendant need operate

in addition to shifting the connections from the low voltage to the high voltage transformer taps, it is necessary to connect the field winding of the motor to the direct current exciter at the proper time. Synchronous motors are usually of sizes which require a starting compensator of greater capacity than the average manual size, and are in many cases wound for high voltages. For these reasons also it is said that automatic control with magnetic contactors is desirable. Oil switches are used, one for connecting the motor to the starting transformer, and another to connect the motor to the line. After the motor is up to speed and the field switch closed, the starting switch must be opened and the running switch closed.

In a pumping station installation the start and stop push button station was located a mile distant. For automatic starting of a synchronous motor driving a pump, a float switch may be employed which will start the motor at low level and stop it when a predetermined high level is reached. On a closed system, a pressure regulator may be used in place of the float switch for the starting and stopping. With some installations a magnetic clutch is used between motor and driven machine which remains disengaged during the period that the motor is getting up to speed and synchronizing.

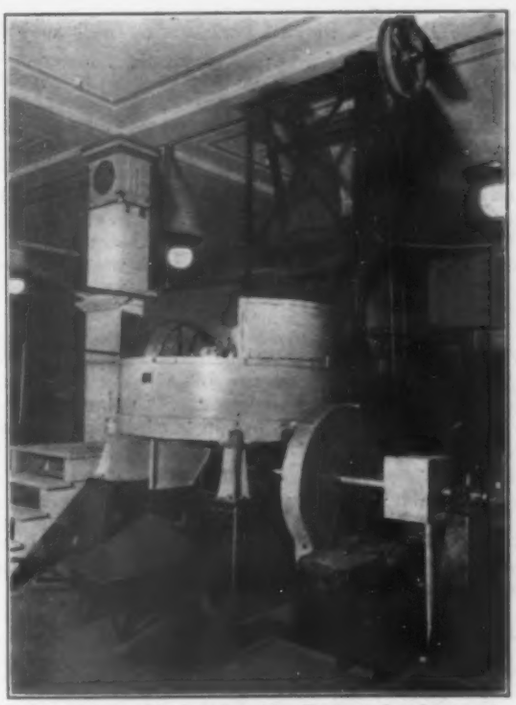
## Record Output of Ford Cars

Another daily production record was made by the Ford Motor Co., May 28, when 6781 cars and trucks were turned out. This replaces the record of 6615 cars and trucks made May 9. Output during the week ended May 29 was another new record of 39,563 vehicles, replacing the figure of 39,418 of the preceding week. The week of May 15 had also shown a new record at 39,303, while the week of May 8 had provided 39,053; thus four successive weeks established four new records.

## Sand Mixer with Direct Motor Drive

The Simpson sand mixer of the National Engineering Co., Chicago, is being offered with the bucket loader and direct motor drive arrangement illustrated.

The mixer shown, the No. 2, is 6 ft. in diameter and is said to be particularly useful in the preparation of facing and core sands. The loading device holds the correct amount of material for the mix and permits the entire batch to be fed into the mixer at one time so that it all gets the same amount of mixing. The loader



Sand Mixer Equipped with Bucket Loader and Direct Connected Drive

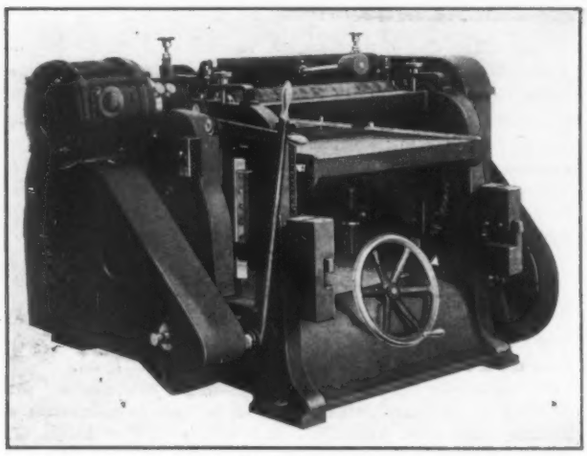
is also said to add to the capacity of the mixer because it permits a charge to be fed into it as soon as the previous batch has been discharged. The machine is set high enough so that the automatic discharge is directly into a wheelbarrow or loading car placed on the foundry floor. The capacity of the No. 2 machine is from 7 to 10 cu. ft. per charge.

The motor is direct connected as shown, and drives the mixer shaft through cut gearing. The loader is driven from the mixer shaft by sprockets and chain.

## Improved Wood Planers

An improved No. 61 surfacer for pattern shops, having direct motor drive as a feature, has been developed by the Oliver Machinery Co., Grand Rapids, Mich. The rotor of the motor is mounted directly on the shaft of the cutting cylinder and the stator is fastened directly to the frame of the machine, thus eliminating all belting. This arrangement has also been incorporated in other sizes of the company's surfacers.

The No. 61 machine is available in two widths, 24 and 30 in., respectively, and the bed may be lowered to receive material up to 8 in. thick. Standard feeds are 14, 18, 24 and 31 ft. per min. The construction of the cylinder, cylinder pulley, and other components are the same as in the previous machine, but the cylinder



Single Surfacer With "Motor-On-Head" Drive Feature. The motor is mounted directly on the end of the cutter head or cylinder, eliminating belting

may be mounted in ball bearings as well as babbitt bearings.

The motor-on-head drive illustrated is recommended where 3600 r.p.m. polyphase alternating-current motors may be used. Where direct-current 3600 r.p.m. motors are used, the "coupled-to-cylinder" type of drive which carries the motor on a bracket attached to the machine and couples it to the cylinder is recommended. "Coupled to counter-shaft" is still another method of drive available, being for use where motors of 1800 r.p.m. or less, either a.c. or d.c. are used. In this, the motor is coupled to either end of the countershaft, and mounted on the floor or on an adjustable base.

A motor knife grinder, designated as the No. 100, which operates from a lamp socket and is designed to operate on any of the company's surface planers or jointers, has also been developed. It grinds the knives while they are held in place in cutting position in the heads. Frequent whetting and joining is said to be a comparatively simple matter, the knives being conveniently kept sharp.

The company's smaller single surface planer, made in 20 and 24-in. sizes, has also been improved and is now designated as the No. 199 instead of No. 99 as heretofore.

## Engineers Will Investigate Storage of Coal

WASHINGTON, June 5.—With a view to determining the engineering, chemical, and economic factors involved in the storage of coal, and the influence of those factors on storage at the mine and by various classes of consumers, the Federated American Engineering Societies has instituted a comprehensive survey. It is the purpose to so coordinate the study with the work of the United States Coal Commission, the Department of Commerce and the Bureau of Mines as to avoid duplication, confusion and conflict. The undertaking has been begun because it is maintained that no adequate, comprehensive study of the kind proposed has been made, but that it is necessary in order to develop a definite conclusion relating to the various advantages claimed for storage of coal. When finally completed and approved the report will be printed in book form.

Advantages that have been claimed for a larger practice of storing coal by dealers and consumers are that it would materially reduce the intermittent aspect of the coal industry; would result in an ample supply of coal at all times; would even up the demand for transportation facilities; would enable a larger resort to water transportation and would reduce operative and transportation expenses and, therefore, would lead to a reduction in the cost of coal to the consumer.

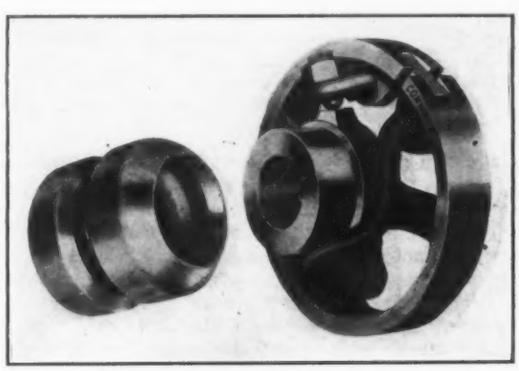
## Mammoth Canadian Power Development

The Quebec Development Co., which will develop ultimately 1,200,000 hp. by the construction of a large dam at the Grand Discharge from Lake St. John, at the head of the Saguenay River in Quebec, has placed the contract for the electrical equipment with the Canadian Westinghouse Co., Hamilton, Ont. The order includes eight hydro-electric generators, rated at 30,000 kva. each at 80 per cent power factor, generating 13,200 volts, 3-phase, 60-cycle at 112½ r.p.m. These generators are of the vertical shaft type and are equipped with Kingsbury thrust bearings. A direct connected exciter with a capacity of 225 kw. at 250 volts will be supplied with each generator. The contract includes also the installation of this equipment in the new plant of the Quebec Development Co. at Isle Maligne, on the Saguenay River, 3 miles from Lake St. John. The apparatus on this order was designed by the engineers of the Canadian Westinghouse Co. in collaboration with the engineers of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and will be built in the Hamilton shops of the Canadian Westinghouse Co.

## New Expansion Clutch

Greater than ordinary power for the space occupied is claimed for the unit expansion clutch illustrated, which has been placed on the market by the Conway Clutch Co., Cincinnati.

The clutch is intended for use on hoists, truck loaders, mixers, conveyors and similar machinery. A feature of the clutch is its release. The friction band springs free from the drum and is held tightly concentric to the shaft by means of a guide on the periphery of the carrier. There is a space of 0.01 in. between the



Expansion Clutch for Single Pulley Machines. A feature is its release, the friction band springing free from the drum because of its resiliency

friction band and the drum at all points when the band is released. The large lever ratio embodied in the clutch proper is said to reduce the power required for shifting. The clutch is adjusted for wear by one screw, which is conveniently located. All parts are made to standard gages and may be easily replaced.

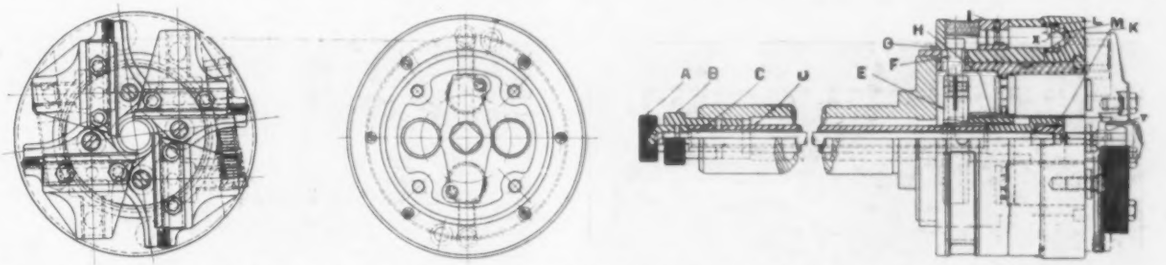
The Providence Engineering Society will hold its annual outing Saturday, June 9, at Fairbank's Farm, Greene, R. I.

## Improved Pipe Threading Machine

An improved pipe and nipple threading machine, the principal feature of which is the use of its internally tripped die head, has been placed on the market by the Landis Machine Co., Waynesboro, Pa. The die head is said to assure automatically a uniform length of thread on nipples and eliminate the necessity of gaging each nipple by hand. The machine will thread, ream and chamfer pipe and nipples.

Referring to the accompanying illustration of the die head it may be seen that the knurled collar *A* and the clamping rod *C* are integral. One end of the clamping rod *C* is threaded and screws into a tapped hole in the shank of the reamer *K*. The knurled collar *B* is integral with the tube *D*, which is threaded on one end and screws into the spider *E*.

The spider *E* has a square hole through it and is tapped part of the way to fit the tube *D*, this giving




Internally Tripped Die Head Designed to Assure Automatically Uniform Length of Thread on Nipples and to Eliminate Gaging Each Nipple by Hand

thread bearings on the four sides of the square hole. The remaining portion of the hole in the spider is plain to afford a bearing for the driver *H*. Driver *H* has a square hole in the end to receive the shank of the reamer *K*.

To set the reamer to the correct position, knurled collar *A* is drawn tightly by hand. This clamps together in one unit, tube *D*, driver *H* and reamer *K*. Surface *Y* on the reamer *K* has no cutting edge, therefore, as the nipple is being threaded and the end begins to bear on reamer *K*, parts *D* and *H* transmit the pressure to spider *E*. Through a medium of pins *F* in spider *E*, rings *G* and *I* are carried backward for a distance *X* or until pin *M* is disengaged from bushing *L*. The full opening movement is then completed by a spring in the adjusting ring. To adjust the reamer *K* longitudinally, clamping rod *C* is unscrewed by turning knurled collar *A* to the left. Collar *B* is then turned to the right or left for a forward or backward adjustment depending upon the length of the thread to be cut.

The die head is equipped with Landis high-speed steel chasers and chamfering reamers, and may be applied to machines in service. The machines are available in the ½, 1¼, 2 and 4 in. sizes and in both single and double types.

## British Companies May Merge

WASHINGTON, June 4.—The largest single steel enterprise in England would result if the Baldwins, Ltd., and the Guest-Keen-Nettlefolds, Ltd., are merged, reports of which have become more persistent now with activity in the two stocks on the exchange, according to a report received by the Department of Commerce by Assistant American Trade Commissioner H. B. Allin Smith, London. He states that in the event the consolidation develops it is said that Baldwin shares will be taken over at an exchange of two Guest-Keen to three of the Baldwin concern. The distinct advantages of the Welsh area for exporting steel, the improved plant of these companies, and a growing demand for their products make this move at this time a significant one for competitive foreign trade.

The capital of Baldwins is £8,500,000 and of the Guest-Keen interests £13,300,000. Some of the properties are in the Midlands, but most of them consist of sheet, tin plate, nut and bolt, and other steel plants along the Bristol Channel.

## Improving the Efficiency of the Blast Furnace

Through its investigations into (1), the reactions taking place at certain zones in the blast-furnace, (2) the effect and elimination of sulphur in coke, and (3) the use of oxygenated or enriched blast, the Department of the Interior, working through the Bureau of Mines, hopes to reach definite conclusions which will be of considerable benefit to the iron and steel industry.

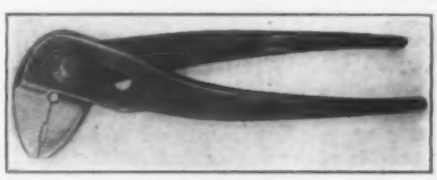
At its Minneapolis experiment station the Bureau of Mines has made several smelting campaigns, these including the regular sampling and determination of gases at fixed planes in the blast-furnace, from which certain deductions can be made. Another run is under way during the present month. Trials are also being made with oxygenated blast.

The behavior and elimination of sulphur in coke is being studied at the bureau's Pittsburgh experiment station, this revealing some interesting facts regarding absorption of sulphur by iron sponge in the furnace.

The possibilities of using oxygenated blast are many, and include, (1) the elimination of hot stoves; (2) the use of an excess of coke to prevent chilling and freezing; (3) the elimination of sulphur; (4) allowance of the utilization of high-phosphorous ores; (5) improvement in Bessemerizing; and (6) lower costs. A committee of ten metallurgists, chemists and engineers, including five Bureau of Mines men, is studying this phase, and will shortly issue a preliminary statement.

## Pliers for General Use

A plier designed for general use, which is quickly adjustable to different sizes of pipes, bolts, nuts, caps and nipples and convenient for use in close quarters, has been placed on the market by the Noble & Westbrook Mfg. Co., Hartford. The new tool, known as the Carlson super-plier, was developed by G. O. Carlson, vice-president of the company. The parts of the plier are drop forged, machined, heat treated and finished. The capacity is 0 to 1 in. square, and 0 to 1⅛ in. round. The weight is ¾ lb. and the length 7 in.



Adjustable Plier for General Use

The additions and extensions now under way at the Pennsylvania Railroad's Altoona works have so increased the consumption of water in and about the shops that the company has appropriated over half a million dollars for the construction of a large masonry dam at Tipton Valley about 10 miles east of Altoona, which, when completed, will supply the shops and railroad yards with a quantity of water adequate to meet all demands. Over 9,000,000 gallons of water are consumed every working day by these shops, which are the largest of their kind in the world. This is almost double the quantity used by the city of Altoona with its 70,000 persons. The new dam will be solid masonry and concrete wall, about 400 ft. long and 78 ft. high.

## Improves Internal Grinder Machine

The Heald Machine Co., Worcester, has added features to its hydraulically driven No. 72 internal grinding machine, which was described in THE IRON AGE of March 1.

An outstanding new feature is the mechanism illustrated by which the operator may run the wheel slide out of the way to permit gaging or removal of the work with minimum loss of time. To accomplish this, the hand lever at the left is lifted, as shown, which causes the dog to pass over the reverse trip lever, permitting the slide to continue its rearward movement. When the bevel on the bar, which is shown under the dogs, reaches the roll at the right-hand end the roller actuates a plunger that operates a valve and permits the oil to go through a by-pass. This, in turn, causes the slide to move at high speed to the limit of its travel. By throwing the reverse lever to the left the table comes up to the work at full speed, slows down to its normal working speed and is ready to grind again.

A new swinging work guard that is operated simply by releasing a spring catch, which causes the guard to swing up out of the way automatically, and which is a convenience for the operator when gaging or removing the work, has also been incorporated. Piping for water or grinding compound is accessibly located on the outside of the machine for convenience in making repairs. The supply of water is started or stopped automatically by manipulation of the clutch lever on the head that starts and stops the rotation of the work spindle.

The swinging diamond truing device is a feature. It is mounted so that, once set for the desired position, it is only necessary to swing the diamond holder into position and occasionally dress of the wheel. The hole size in the work is said to be maintained with only occasional plugging or gaging. When the wheel is worn slightly, the pawl, shown at the left in the illustration of the positive stop and hand feeding mechanism, is lifted and the dial moved one or two notches as desired. This will move the wheel into position where it can be trued, and after which it will be in the same relation to the work as when it was first started up, maintaining the hole size.

The direction of movement of the cross slide has been reversed, the feeding pawls in the improved machine acting downward instead of upward, and the stop and its adjustment are on top of the ratchet as shown.

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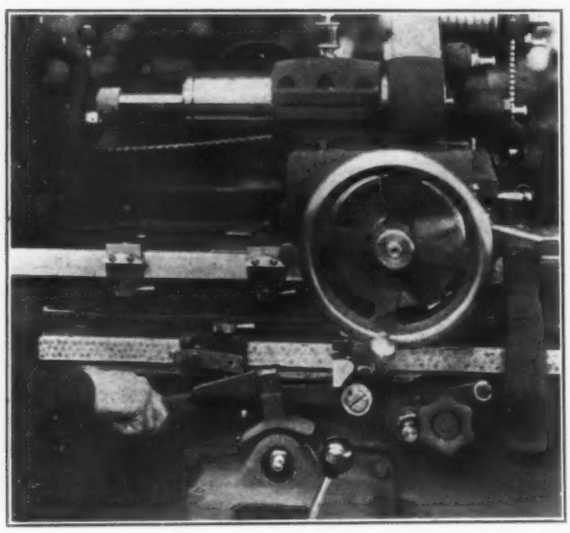
The Lambert Tire & Rubber Co., Barberton, Ohio, will enlarge its plant, adding 5000 sq. ft. to its present floor space.

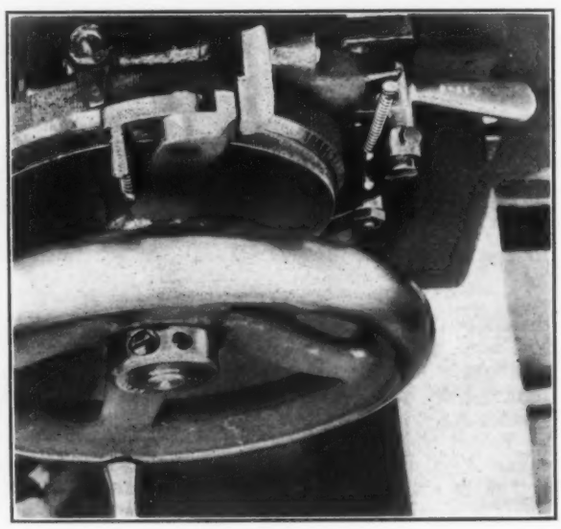
## New Line of Twist Drills

The Cleveland Twist Drill Co., Cleveland, is placing on the market high-speed drills made by what is called the "Cle-Forge" process. These drills are hot worked where necessary to impart toughness and are afterward machined in the same manner as a milled drill. It is said that they cannot be distinguished from the former milled product by mechanical inspection. In cutting quality and strength they are said to surpass former types of forged drills and their accuracy to be equal to that of milled drills.

High-speed drills have been made by two methods for the last few years. The first method involves a hot-working process to form the flutes, followed by a machining and twisting process, or simply by a twisting process without the machining. In both cases the web may not be central, and returning it to the correct position is by a straightening process or flute grinding process or both. In the second method of manufacture the drill is milled from round bars, and in spite of the additional toughness imparted by the first method, the milled type of drill preponderates, which is attributed to the fact that the webs of such drills are centrally located by the milling machine.

The Cleveland company has manufactured both milled and forged drills and has been experimenting with a view to placing on the market a drill which would incorporate the advantages of both the forged and milled types. The "Cle-Forge" drill is the result of these experiments.





Rapid Return for the Table Is an Added Feature of the Heald Hydraulically-Operated Internal Grinder. Close-up-view of dogs which control the reversing mechanism is at the left, movement operating dog release lever for rapid traverse for table being also shown. Top view of feeding mechanism of cross slide table is at the right

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## Shells in Strip Steel

The result of an analysis of data on open-hearth practice resulting in shelly strip steel, made by F. B. Foley, metallurgist of the Bureau of the Interior, at the Mississippi Valley experiment station of the Bureau of Mines, Rolla, Mo., showed that heats which produce shells are shorter heats, that they take more ore and less spar, and that they give a lighter ladle skull than those that produce metal free from shells. The indication is that shells are the result of running the heat in the open-hearth furnace too hot and bringing down the carbon too fast by oreing. The metal is thus apparently over-oxidized.

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The Central Steel Co., Massillon, Ohio, has definitely decided to erect its blast furnace and ultimately its by-product coke plant in Massillon. When the company decided to build a blast furnace, there was uncertainty about its location, a lake front as well as the Massillon site being considered.

## New Hydraulic Broaching Machine

A new broaching machine of the single unit type, operated on the hydraulic principle, has been placed on the market by the J. N. Lapointe Co., New London, Conn. Due to the manner of operation, an efficiency of 98 per cent is claimed for this machine, as many as 250 pieces per hour having been broached with a broach 48 in. long. Long life of the broach is regarded as due largely to lack of vibration in the hydraulic type machine.

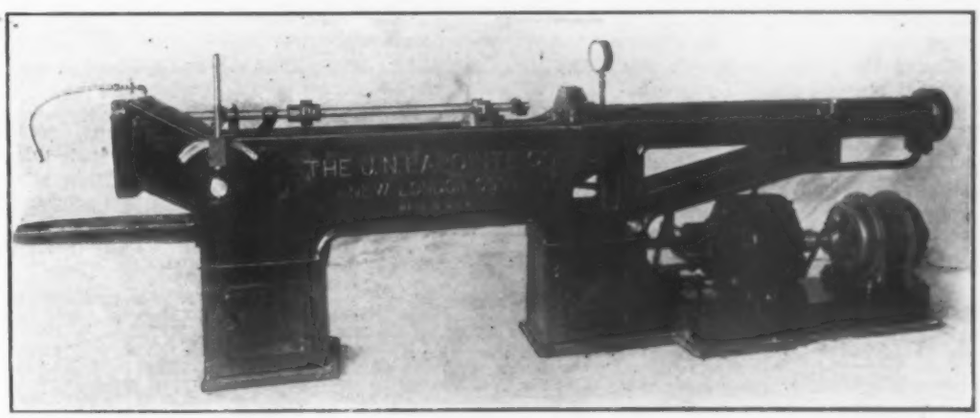
The machine consists essentially of the guides and drawhead normally found on broaching machines and the hydraulic actuating member. The drawhead carries the standard floating or adjustable pull bushing holder. Instead of the screw which is usually attached to the drawhead is a shaft, on the far end of which is the hydraulic piston fitted in a 6 in. diameter cast iron cylinder, which is cast integral with the guide casting.

The actuating mechanism consists of a Hele-Shaw fluid motor which delivers oil at high pressure and low volume, maximum pressure being 1500 lb. per sq. in. or a pull of 35,000 lb. with a normal working pressure of 700 lb. Oil is delivered first to one side of the piston, then to the other for pull or return strokes. One advantage claimed for hydraulic operation is the variable pressure available, making it possible to vary the stroke from zero to 25 ft. per min. on cutting speed, depending upon material to be broached and the strength or delicacy of the broach.

Broaches are tested before leaving the factory and stamped with the proper working pressure. When using a broach so marked, the relief valves in the pump line are set for proper pressure, thus serving to protect the tools. These valves are placed in the fluid reservoir.

The machine is controlled by a lever mounted at the work end, as is the case with the common screw type of machine. This lever operates a reach rod, which in turn, through a link motion, controls the rack operating the pump control pinion. The pinion, through an eccentric adjustment, varies the stroke of the pump, thereby changing the pressure.

A knockout shaft is also provided on this type machine. On it is mounted an adjustable collar, which can be positively locked to a hub pinned on the shaft.



New Hydraulic Broaching Machine Permits Variations in Pressure and Speed of the Pull Stroke

This collar may be set and locked to limit the amount of stroke of the control mechanism, so that when the collar is set by the foreman, the operator may not open the pump farther for greater pressure and faster stroke, thus being a further check on tool breakage. This does not affect the full speed return.

In the oil line is a shuttle valve consisting of a floating spool which by pressure is moved to close one oil intake from the reservoir, so that oil is delivered only to the side of the pump required for cutting or return stroke. A gage is provided on the machine which shows the working pressure and also serves to indicate increases in pressure due to dull tools.

The pump mechanism is oiled through the slight leakage which takes place under the pressure of operation, thus automatically caring for the bearings. A separate tank is provided for cutter lubricant with a separate geared pump for distribution. Delivery of the compound is made through piping concealed under the body of the machine leading to a cored hole in the workhead, whence a flexible tube carries it to the work. A swinging drip pan is placed on the workhead and can be thrown aside when large work holders are in use.

The machine shown is driven by individual motor, 7½ hp. being sufficient. Belt drive may be provided by mounting hangers in place of the motor, with pulleys and shaft to the flexible coupling. The principal specifications are:

Stroke, 56 in.; hole in face plate, 5 in. diameter; vertical adjustment of drawhead, 15⅝ in. above and below center; floor space, 13 ft. 6 in. x 27 in.; weight, 3500 lb.

## Repairing Flask Pin Holes by Welding

A recent application of arc welding in foundry practice is in the repair of worn flasks. The pin hole in the upper malleable iron lug on flasks wears in time to such a large diameter that the pin on the other half of the flask will not fit in it sufficiently tight to hold the parts in proper alignment. In repairing this defect, the practice has been to ream out the hole to ⅞ in. diameter and then press in a bushing having the correct diameter hole, ⅝ in. When the bushing wears too large it is then replaced with a new bushing.

The new method of repair by arc welding is less expensive and more satisfactory, according to A. M. Candy, general engineering department, Westinghouse Electric & Mfg. Co., East Pittsburgh. In this the practice is to ream out the hole to ⅞ in. diameter and then fill the hole completely, using the metallic-electrode arc welding process. A piece of copper is placed under the hole, and the welding is done using about 175 amp. and 5/32 in. welding wire. The time required to weld one hole is said to be about 3 min. When the holes are again worn oversize, it is unnecessary to ream them out before the welding operation, in which case the time required to weld a hole is reduced to about 2 min.

The cost of welding each hole as originally drilled to ⅞ in. diameter is stated to be about as follows: Labor at 70c per hr., 3.5c; welding wire at 8c per lb., 1.6c; electric power at 3c per kwhr., 1.3c; total cost 6.4c.

The question naturally arises as to why it is necessary to drill a ⅞ in. hole in the casting when only a ⅝ in. hole is required for the pin on the flask. The reason is that there will be a layer of very hard chilled high-carbon cast steel about 1/16 in. thick in the region where the deposited metal unites with the casting; therefore, it is necessary to have the original hole ¼ in. larger than the final hole, so that no difficulty will be experienced in drilling the final hole through the deposited metal.

A new edition of the oil booklet, entitled "Oil Burning in Power Plants," published by the National Airoil Burner Co., Ninth and Thompson Streets, Philadelphia, is ready for distribution to those who are likely to be interested.

# High Tonnage in Iron and Steel Imports

## March Shows Large Increase Over February—More Than Seven Times as Great as March, 1922—Pig Iron, Ferromanganese and Scrap Predominate

WASHINGTON, June 5.—Developing the heavy pig iron movement of 72,344 gross tons, imports of iron and steel in March aggregated 106,197 tons, valued at $3,470,623, an increase of 38,493 tons over February, when they totaled 67,704 tons, valued at $2,689,473. The difference between the March and February totals is explained by the remarkably large imports of pig iron which indicates that shipments against heavy contracts had not been completed. The imports of pig iron in February having been 35,793 tons, the difference between this total and the total for March was 36,551 tons, or within 2000 tons of the difference between the totals of all iron and steel imports in these two months.

*Imports of Iron and Steel into the United States*
(In Gross Tons)

| | March, 1922 | March, 1923 | Nine Months Ended March 1922 | Nine Months Ended March 1923 |
|---|---|---|---|---|
| Pig iron | 1,871 | 72,344 | 24,178 | 549,118 |
| Ferromanganese | 3,819 | 8,082 | 10,031 | 87,340 |
| Ferrosilicon | 343 | 948 | 8,449 | 13,930 |
| Scrap | 2,844 | 20,047 | 29,247 | 169,486 |
| Steel ingots, blooms, billets, slabs and steel bars | 1,846 | 1,149 | 13,368 | 22,814 |
| Rails and splice bars | 1,387 | 838 | 16,408 | 14,685 |
| Structural shapes | 177 | 532 | 974 | 7,949 |
| Boiler and other plates* | .... | 2 | ..... | 1,498 |
| Sheets and saw plates | 15 | 63 | 260 | 739 |
| Bar iron | 322 | 119 | 2,061 | 7,563 |
| Tubular products* | .... | 583 | ..... | 2,031 |
| Castings and forgings* | .... | 73 | ..... | 769 |
| Nails and screws* | .... | 132 | ..... | 481 |
| Tinplate | 1,223 | 425 | 1,938 | 6,042 |
| Bolts, nuts, rivets and washers* | .... | 19 | ..... | 104 |
| Wire rods | 293 | 133 | 985 | 2,422 |
| Round iron and steel wire* | .... | 514 | ..... | 1,786 |
| Flat wire and strip steel* | .... | 44 | ..... | 492 |
| Wire rope and insulated wire, all kinds* | .... | 150 | ..... | 362 |
| Total | 14,140 | 106,197 | 107,899 | 889,611 |
| Manganese ore | 15,120 | 12,799 | 140,803 | 244,486 |
| Iron ore | 12,013 | 166,626 | 98,084 | 1,443,320 |
| Magnesite | 6,708 | 3,437 | 75,178 | 69,551 |

*Not reported separately previous to Sept. 22, 1922.

*Imports of Machinery into United States*
(By Value)

| | March, 1922 | March, 1923 | Nine Months Ended March, 1922 | Nine Months Ended March, 1923 |
|---|---|---|---|---|
| Metal-working machine tools and parts | $21,828 | $93,582 | $137,166 | $285,526 |
| Agricultural machinery and implements | 70,409 | 67,508 | 171,990 | 626,330 |
| Electrical machinery and apparatus* | ..... | 3,950 | ..... | 12,132 |
| Other power generating machinery* | ..... | 361,945 | ..... | 1,529,783 |
| Other machinery | 189,121 | 206,831 | 2,472,593 | 1,902,004 |
| Vehicles, except agricultural | 155,478 | 278,710 | 1,285,385 | 1,392,995 |
| Total | $436,836 | $1,012,526 | $4,067,134 | $5,748,770 |

*Not reported separately previous to Sept. 22, 1922.

For the nine months ended with March, iron and steel imports totaled 889,611 tons. Of this aggregate 549,118 tons or 61.7 per cent consisted of pig iron. The next greatest item of imports was scrap, which for the nine months totaled 169,486 tons, and for March 20,047 tons. Ranking next was ferromanganese, whose imports for the nine months amounted to 87,340 tons and for March 8082 tons. Imports of pig iron, scrap and ferromanganese combined aggregated 805,944 tons, or 90.6 per cent of the nine months' total.

Of the imports of pig iron England has been by far the greatest source of origin, imports from that country for the nine months having amounted to 235,577 tons. England also was the chief source of imports of pig iron in March, with a total of 30,958 tons. Scotland was the second greatest source of pig iron imports for the nine months, the total being 109,664 tons.

*Imports of Pig Iron by Countries*
(In Gross Tons)

| | March, 1923 | 9 Months Ended March, 1923 |
|---|---|---|
| England | 30,958 | 235,577 |
| France | 16,566 | 88,973 |
| Canada | 10,455 | 34,385 |
| Germany | 6,091 | 19,215 |
| Belgium | 4,104 | 57,182 |
| Scotland | 3,870 | 109,664 |
| Sweden | 300 | 784 |
| China | ..... | 502 |
| Netherlands | ..... | 2,537 |
| Austria | ..... | 299 |
| Total | 72,344 | 549,118 |

England, of course, was the greatly predominant source of imports of ferromanganese. Out of the total shipments for March England contributed 8053 tons, Germany 25 tons and Canada 4 tons.

It is interesting to observe that of the 12,799 tons of manganese ore imported in March the largest lot coming from any single country, 6036 tons, was credited to British West Africa, with Brazil ranking second, the manganese ore imports coming from the latter country being 4227 tons. Imports of this product from the Black Sea ports was 2505 tons. Imports of iron ore in March totaled 166,626 tons, Cuba being the leading source of these imports with a total of 52,000 tons.

Of the 838 tons of rail imports in March, 685 tons came from Germany, 112 tons from the Netherlands and 41 tons from Canada.

Imports of machinery showed a sharp increase in March, with a value of $1,012,526, compared with

*Imports of Iron and Steel in Gross Tons*
(Monthly Averages)

| | Total Imports | Pig Iron | Ferro-alloys | Manganese Ore and Oxide* |
|---|---|---|---|---|
| 1909 to 1913, incl. | 26,505 | †14,132 | ..... | ..... |
| 1914 to 1918, incl. | 23,351 | 4,645 | 3,281 | ‡47,155 |
| 1919 to 1921, incl. | 23,901 | 5,708 | 3,710 | 37,115 |
| 1922 | 59,545 | 31,954 | 9,117 | 31,204 |
| January, 1923 | 120,078 | 83,935 | 5,120 | 829 |
| February | 67,704 | 35,793 | 9,234 | 4,636 |
| March | 106,197 | 72,344 | 9,030 | 12,799 |

*Not included in "total imports."
†Includes ferroalloys.
‡Average for three years, 1916 to 1918, only.

*Imports of Iron Ore by Countries*
(In Gross Tons)

| | March, 1922 | March, 1923 | Nine Months Ended March, 1922 | Nine Months Ended March, 1923 |
|---|---|---|---|---|
| Spain | 1,000 | 24,471 | 15,758 | 72,182 |
| Sweden | ..... | 41,535 | 27,817 | 368,868 |
| Canada | 413 | 31 | 3,740 | 2,041 |
| Cuba | 10,600 | 52,000 | 47,147 | 477,788 |
| Other countries | ..... | 48,589 | 3,622 | 522,441 |

*Imports of Manganese Ore by Countries*
(In Gross Tons)

| | March, 1923 | | March, 1923 |
|---|---|---|---|
| British West Africa | 6,036 | Germany | 21 |
| Brazil | 4,227 | Netherlands | 10 |
| Russia (in Europe) | 2,505 | | |

February's value of $815,815. A heavy increase was made in metal-working machine tools, power generating machinery and vehicles, but a striking decline was registered in agricultural machinery.

Total imports in March (106,197 tons) were nearly as great as those for the entire nine months of last year (107,899 tons). March imports of pig iron (72,344 tons) exceeded the total for the three full calendar years 1916, 1917 and 1918 (61,350 tons), the figure for 1918 having been only 2003 tons.

## Scratch Hardness of Copper

The Bureau of Standards is conducting an investigation of the instrument used for the determination of the scratch hardness of metals, and in connection with this work, considerable attention was paid during the past month to the effect of various amounts of cold working on the hardness of copper. The results obtained in cold rolling very pure, electrolytic, unmelted copper and also ordinary commercial copper indicate clearly that the early stages of the deformation of the metal harden it very rapidly. The maximum degree of hardness is soon reached, however, and a reversal occurs, the metal becoming very appreciably softer as the deformation process is continued, so that the metal in its final condition after cold rolling is completed is softer as measured by the scratch hardness method than in its initial state. These results were confirmed by tests made on the same material by the micro-Brinell method. Annealing cold-rolled sheets at a low temperature (100 deg. C.) softens the material appreciably, but the general form of the hardness deformation curve is not affected. The work will be extended to a few other metals to determine whether this behavior is peculiar to copper or more general in its nature.

## Tests of Welded Pressure Vessels

For several years efforts have been made to draw up a code for the welding of unfired pressure vessels. Opinions of the best welding experts were not in agreement on many essential points. Fundamental, scientific knowledge, based on test data was not available. The American Bureau of Welding (research department of the American Welding Society), has completed a series of tests on some 50 tanks. The program involved an expenditure of over $15,000. The test data, analysis of same, conclusions and recommendations to the boiler code committee of the American Society of Mechanical Engineers have been compiled in a report, copies of which may be obtained from the American Welding Society, 33 West Thirty-ninth Street, New York, at $1.50 to members and $5 to non-members.

Pittsburgh and Cleveland sections, Association Iron and Steel Electrical Engineers and their friends to the number of 350 were guests of the Morgan Engineering Co. and the Alliance Machine Co., Alliance, Ohio, on a joint inspection trip Saturday, May 26. Following a luncheon at the Morgan plant, the visitors made a tour of that plant, there being many cranes and other lines of steel plant equipment on the floor. This was followed by a trip through the plant of the Alliance Machine Co., where also much steel plant equipment was seen in process.

Iron molders' wages in England in March were 59 s. 2 d. per week, or 42 per cent above the wages of August, 1914, when they were 41 s. 8 d. according to the Ministry of Labor of Great Britain. Laborers in the metal-working trades received 40 s. 3 d. weekly in March, 1923, against 22 s. 10 d. in 1914, or 77 per cent more.

What is said to be one of the largest single orders for steel car floats ever given was that placed recently by the Pennsylvania Railroad Co. with the New York Shipbuilding Co., Camden, N. J. It covered ten floats at an aggregate price of about $700,000.

# MINING AND SHIPPING

## The Iron Industry in 1922 Compared With the Preceding Year

Figures showing the production and shipments of iron ore, pig iron, and ferroalloys in the United States in 1922 have just been made public by the Interior Department in tables compiled by Hubert W. Davis, of the Geological Survey.

Considerably more iron ore was mined in 1922 than in 1921. The Chattanooga and Birmingham districts made gains of 126 per cent and 73 per cent, respectively, and the Lake Superior district made a gain of 58 per cent. The Adirondack district was the only one that mined less ore than in 1921. The average value per ton of iron ore at the mines in 1922 was $3.12, which is 25c. less than in 1921. The stocks of iron ore at the mines in 1922 amounted to 10,524,279 gross tons, a decrease of 24 per cent from those in 1921.

*Iron ore mined in the United States in* 1921 *and* 1922 *(in gross tons) by States running more than* 50,000 *tons. Total includes the nine States running less than* 50,000 *tons.*

| State | 1921 | 1922 | Percentage of increase or decrease in 1922 |
|---|---|---|---|
| Alabama | 2,876,141 | 5,234,568 | + 82 |
| Michigan | 7,075,204 | 10,453,578 | + 48 |
| Minnesota | 17,811,325 | 28,768,960 | + 62 |
| Missouri | 36,550 | 58,408 | + 60 |
| New Jersey | 58,589 | 90,359 | + 54 |
| New Mexico | 110,528 | 118,038 | + 7 |
| New York | 469,988 | 444,381 | — 5 |
| Pennsylvania | 146,649 | 780,836 | +432 |
| Tennessee | 25,709 | 156,464 | +509 |
| Utah | 60,773 | 15,018 | — 75 |
| Virginia | 74,021 | 30,971 | — 58 |
| Wisconsin | 257,014 | 577,024 | +125 |
| Wyoming | 234,701 | 332,800 | + 42 |
| | 29,282,690 | 47,128,527 | + 61 |

Iron ore shipped from the mines in the United States in 1921 and 1922 was as follows:

1921..... 26,652,528 gross tons
1922..... 50,612,620 gross tons

It will be noted that in 1921 the tonnage of ore mined exceeded the shipments, while in 1922 the reverse was true.

### Pig Iron

Gains in the shipments of pig iron in 1922 were recorded by every producing State except Virginia, Missouri, and Massachusetts. The increases were more pronounced in Kentucky, Tennessee, Michigan, Wisconsin, and New York. The general average value for all grades of pig iron at the furnaces in 1922 was $21.98 a ton, a decrease of $2.30 from the value in 1921.

Pig iron shipped from blast furnaces in the United States in 1921 was 16,038,619 gross tons, valued at $389,437,792, and in 1922, 27,670,738 gross tons, valued at $608,144,858.

### Ferroalloys

An increase of 70 per cent in the shipments of ferroalloys is shown for 1922. The shipments of ferrosilicon showed an increase of 181 per cent and those of ferromanganese an increase of 45 per cent. The shipments of spiegeleisen only slightly exceeded those in 1921. The average value of ferromanganese at the furnaces in 1922 was $66.04 a ton and of spiegeleisen $30.79 a ton.

Shipments of ferroalloys of domestic manufacture in 1921 amounted to 248,627 gross tons, valued at $21,697,785, and in 1922, 423,280 tons valued at $28,259,004.

## Manganese Steel Welding Rods

Welding rods of manganese steel have recently been introduced which are claimed to be successful in the welding of manganese steel or the building up of worn manganese steel parts. They are being manufactured by the Manganese Steel Forge Co., Real Estate Trust Bldg., Philadelphia, under the name of "Rol-Man" manganese steel rods. The rods are claimed as especially fitted for the welding of electric steel or steam railroad parts, where the repair of manganese steel, frogs, crossings, layouts and special track work is often necessary, and for rebuilding worn manganese steel wearing parts in mills, mines, crushing plants, cement mills, etc.

# Disintegration of Blast Furnace Linings

## Effect of Ferric Oxide and Other Iron Compounds—Uniformly Distributed Vs. Localized Oxide—Influence of Burning Temperature

BY C. E. NESBITT AND M. L. BELL*

STUDY of the effect of ferric oxide or other iron compounds necessitated the preparation of special brick with known amounts of ferric oxide or such compounds as may be converted into ferric oxide in burning the bricks. Various percentages of iron in the form of ore, ferric oxide or pyrites were added to the mix. The iron ore series was the most complete, the following percentages of ore by weight being added: 0, 0.025, 0.100, 0.250, 0.500, 1.00, 1.50 and 2.00 per cent. The mix with pure ferric oxide contained 1½ per cent of added oxide, and the mix with iron pyrites, 1½ per cent of added pyrites. The addition in each case was ground to pass a 20-mesh screen and remain on a 40-mesh.

The bricks were molded by hand to 9-in. size and dried. Part of the brick were burned in a test kiln, and a duplicate series in a large commercial kiln along with regular brick, for the purpose of comparison with those burned in the test kiln. The burned bricks of each kind were then subjected to carbon monoxide for 10 hr. at 420 deg. to 450 deg. C. The results from the bricks burned in test and commercial kilns were practically identical.

In the series with added amounts of iron ore, there was no disintegration in the bricks without added ore, a slight cracking at 0.25 per cent, and a marked increase in disintegration with increasing percentages of ore, the last of the series being badly shattered. Typical examples are shown in Fig. 6.

Bricks containing 1½ per cent of pure ferric oxide and those with 1½ per cent of iron pyrites failed practically in the same manner as bricks with corresponding amounts of iron ore. Test brick made from selected clay without the addition of iron ore showed no disintegration after being subjected to carbon monoxide for 36 hr. Ordinary commercial bricks placed alongside these brick failed completely in 10 hr.

Typical bricks of each series were exposed to the action of blast furnace gas. The bricks showed the same results as with concentrated carbon monoxide, but required a longer exposure. The bricks failed under these conditions in from 3 to 10 days, depending on the amount of iron added. Ordinary commercial brick failed in 10 days.

### Effect of Uniformly Distributed or Localized Iron Oxide

Examination indicated that the size of iron impregnations had a pronounced effect on disintegration. To prove this, a series of brick were made in which the same amount of fine or coarse iron ore was added to selected first quality fire clay.

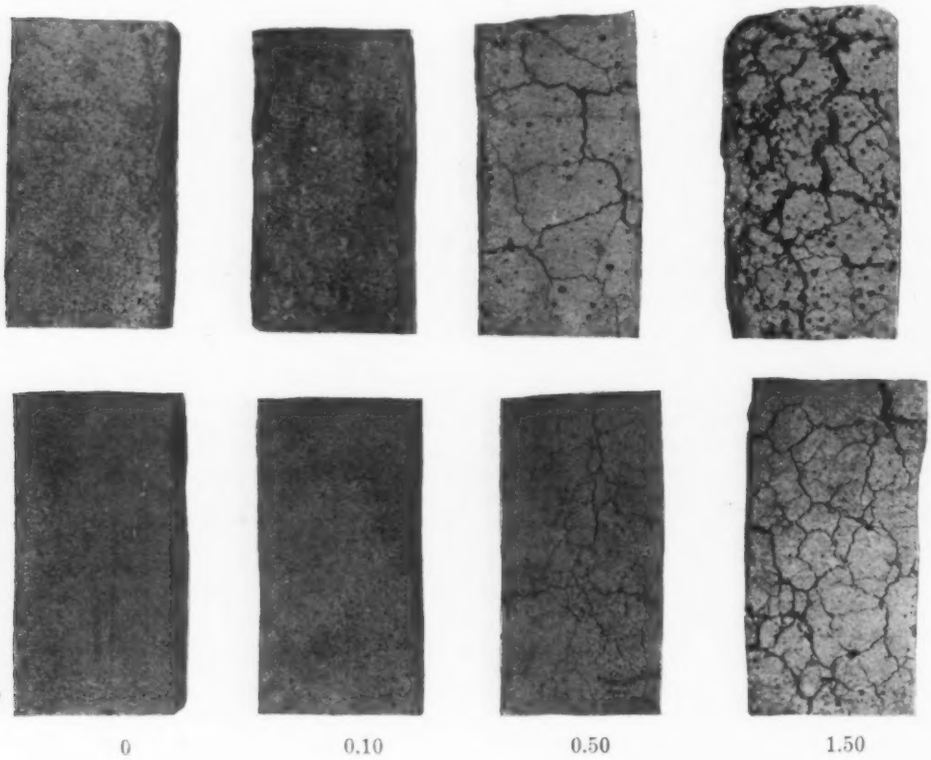



Fig. 6 — Effect of Varying Amounts of Iron in Bricks. Experimental clay bricks after exposure for 10 hr. to carbon monoxide at 450 deg. C. (842 deg. Fahr.). The bricks in the top row were burned in a commercial kiln; those in bottom row in laboratory kiln. The figures beneath the cut give the percentage of iron added to the brick

After exposure for 10 hr. to carbon monoxide at 450 deg. C., the bricks with fine ore additions (passing a 100-mesh screen) showed nothing but small surface cracks and little change in appearance except a darker color. The coarse ore bricks (passing a 3-mesh screen and remaining on an 8-mesh) failed by developing long irregular cracks. Each of the large iron spots at the surface and in the interior showed heavy depositions of carbon, and in many cases cracks radiating from these deposits (Fig. 7).

### Effect of Burning

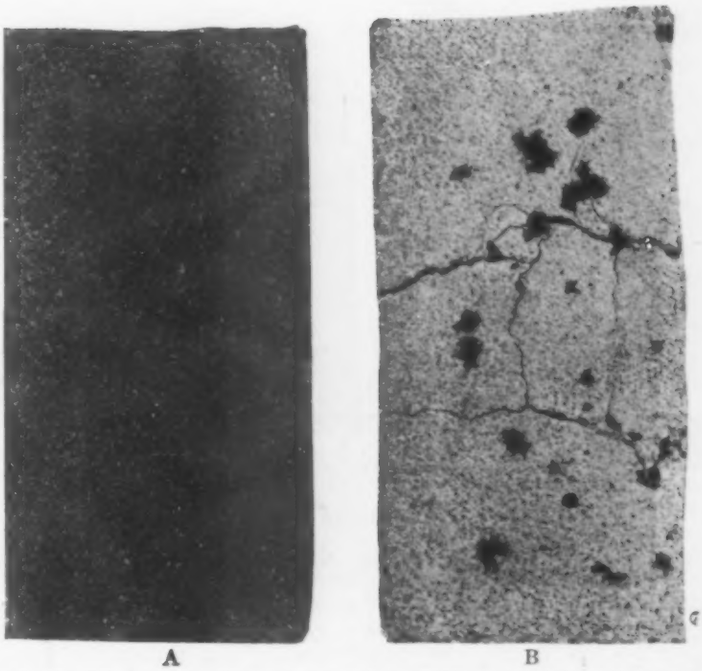
Preliminary work with carbon monoxide showed that soft burned bricks disintegrated much more quickly than similar bricks of a harder burn, indicating that the higher temperature used in burning had left the iron present in a condition not easily acted upon by carbon monoxide. Experimental bricks were then made

*Research engineers, Carnegie Steel Co., Pittsburgh. Abstract of paper before American Iron and Steel Institute; the first installment appeared last week.

using first quality clay and an addition of 2 per cent of finely ground iron ore. After drying, part of the bricks were left unburned, part were burned in a test kiln at 1050 deg. C. (1922 deg. Fahr.), and the balance burned at 1300 deg. C. (2372 deg. Fahr.). The bricks were then exposed to carbon monoxide at 450 deg. C. All the bricks burned at 1050 deg. C. failed from disintegration, while the unburned bricks and those burned at 1300 deg. C. were only slightly disintegrated.

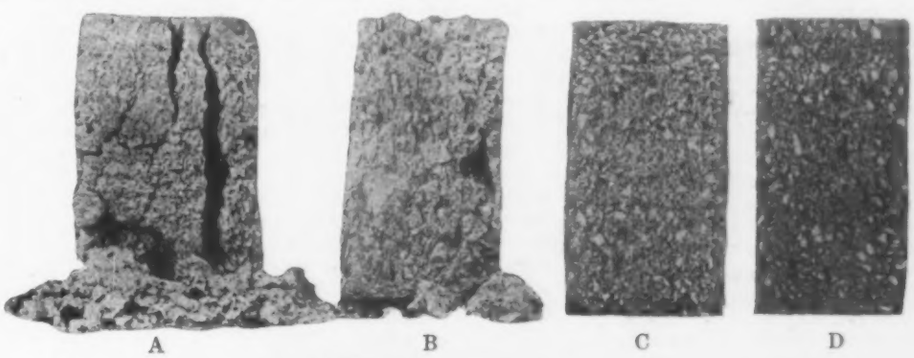
Tests on the effects of burn were also made on commercial bricks. A number of soft burned blast furnace bricks were selected from stock, cut in halves, and one-half of each brick reburned at 1400 deg. C. (2552 deg. Fahr.). When exposed to carbon monoxide at 450 deg. C., the half of the brick in its original condition was disintegrated, while the reburned half was but slightly affected (Fig. 8). The effect of hard and soft burning on commercial bricks is shown in Fig. 9.

Hard burning cannot be considered a method for prevention. The real cause of disintegration is the iron in the clay, and the way to prevent disintegration is to keep contaminated clay out of the bricks, not by burning the bricks at a temperature high enough to combine the iron with the clay. The tendency will be to burn all bricks very hard. This may prevent disintegration to some extent, but will result in the failure of the bricks from other causes. Hard burning makes a brick sensitive to thermal changes, and there will be excessive spalling, particularly in such locations as the top of the blast furnace, where the bricks must stand rapid changes in temperature due to cold charges coming in contact with the heated brickwork.



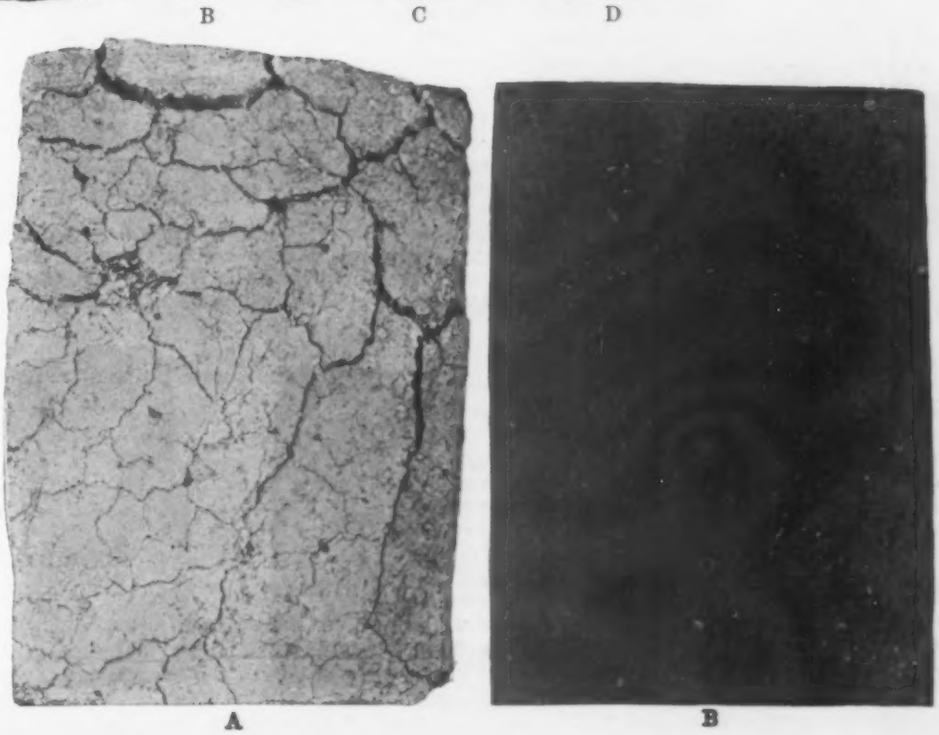
A B

Fig. 7—Effect of the Distribution of Iron Oxide on Disintegration with One Per Cent of Iron Ore Added to Each Brick. *A*, iron ore ground to pass through 100-mesh screen and uniformly distributed. *B*, iron ore ground to pass through 3-mesh and remain on 8-mesh screen



A B C D

Fig. 9 — Effects of the Temperature of Burning. Commercial Bricks. *A* and *B* are soft burned bricks subjected to carbon monoxide at 450 deg. C. for 3 hr.; *C* and *D*, medium to hard burned bricks subjected to carbon monoxide at 450 deg C. for 6 hr.



A B

Fig. 8 — Effect of the Temperature of Burning. Soft burned commercial brick cut into halves, showing *A*, original soft burned portion, and *B*, reburned half of same brick

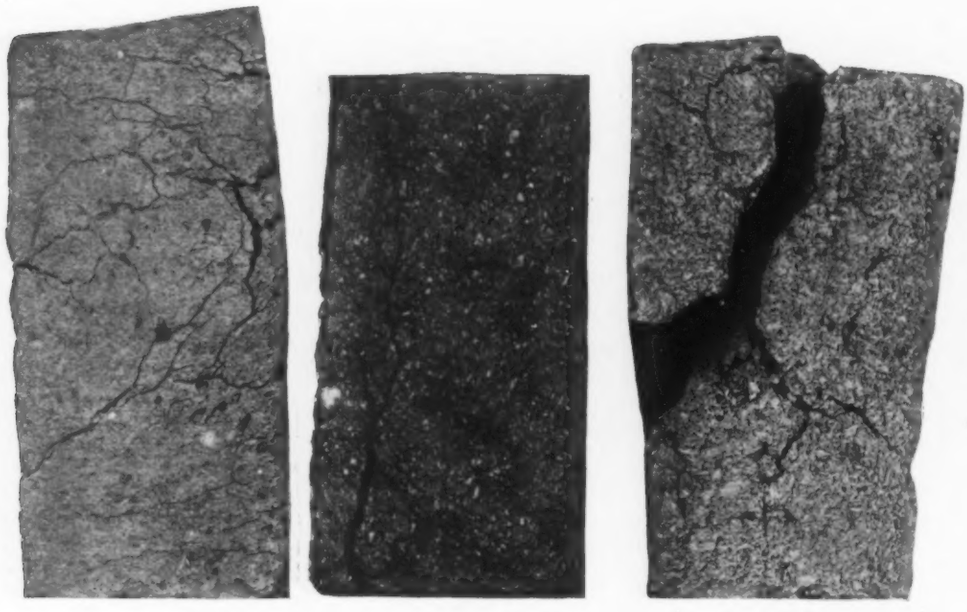


Fig. 10 — Effect of Method of Manufacture on Disintegration. Brick at left was made on Augur machine; that in center was steam pressed. A hand-made brick is shown at right

In testing commercial bricks, it was found that the manner of making the bricks, whether augur made, steam pressed or hand molded, had considerable influence on the ease with which the bricks were disintegrated. The augur made bricks, being laminated by the way in which they are made, fractured along the lines of weakness. Steam pressed bricks usually failed by the brick splitting lengthwise. Hand made bricks fractured irregularly. (Fig. 10.)

Some difference between coarse and fine ground brick was observed, the fine ground brick disintegrating to a slightly greater extent.

### Effect of Ferric Oxide on Other Kinds of Bricks

To show that the disruption of a brick is due to mechanical force exerted by deposited carbon, a chrome, magnesite, silica and a fire brick were drilled with a ½-in. hole extending to the center. Two grams of iron ore was placed at the bottom of each hole and the holes plugged with refractory cement. On account of the strength and density of chrome and magnesite brick, additional holes were drilled 1 in. from the end of each brick and treated in the same manner. The bricks were then subjected to the test and, with the exception of the magnesite, all were cracked, as shown in Fig. 11. The magnesite and particularly the chrome bricks contain considerable iron in combination with their other elements, but apparently this combined iron did not have any influence on disintegration.

### Disintegration Test as a Guide for Quality

Producers and consumers, by the use of the disintegration test, have at hand a ready means of determining the resistance of a brick to disintegration. If bricks of unknown properties are put through the test, and a brick of satisfactory properties be included for the purpose of comparison, results can easily be obtained in 10 hr. which will show whether the unknown brick has sufficient resistance to disintegration to be used in a blast furnace lining.

### Preventive or Remedial Measures

Bricks used in iron blast furnaces cannot be protected from furnace gases. This gaseous atmosphere cannot be changed. Some of the gas will penetrate the bricks. If these bricks contain free ferric oxide, the carbon monoxide in the furnace gas will react with the ferric oxide and deposit carbon. To prevent disintegration effectively, the bricks must be free from uncombined iron oxide. Such bricks can be made only from clays free from these compounds.

As this ideal condition rarely exists, provision for sorting out undesirable compounds must be provided. The almost universal practice of taking the clay direct from the mine to the yard should be stopped. Separating the iron compounds from the clay by washing, screening and grinding is not practicable. The only practical remedy is to weather the clays in a layer not over 2 ft. thick for at least two months. If the weather be dry, the layer must be watered weekly. This treatment will oxidize the iron compounds, which will be apparent by a change to a brown or yellow color. Such lumps or patches must be discarded and only the unstained clay used.

Hard burning is at best a poor remedy for the disease. The real cure is to use clay which is naturally pure. When such clay is not available, the clay should be freed from objectionable iron compounds by such treatment as will yield commercially iron-free clay.

## Discussions of the Institute Papers

THE six technical papers presented at the convention of the American Iron and Steel Institute in New York, May 25, and abstracted in THE IRON AGE, May 31, were not discussed extensively. The paper

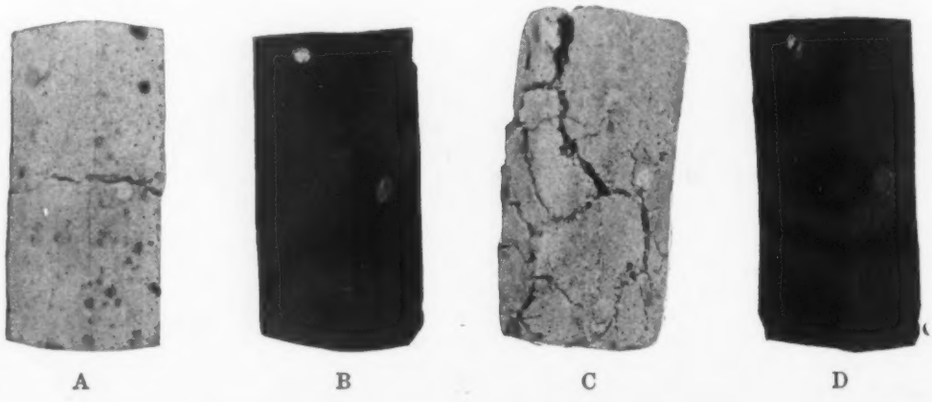



Fig. 11 — Effect of Carbon Monoxide on Ferric Oxide Inserted in Various Kinds of Brick. *A*, silica; *B*, magnesite; *C*, fire brick; *D*, chrome brick

which received the most attention was the one on gas producer practice by Waldemar Dyrssen. The other papers received only brief comment except the one on the "Value of Chemistry in the Steel Industry" by W. A. Forbes, which drew forth some interesting comment from Bradley Dewey on the future value of chemistry to the steel industry. Abstracts of the principal discussions of each paper follow:

## Gas Producer Practice

"The Theory of Gas Producer Practice in Steel Works," by Waldemar Dyrssen was discussed by W. B. Chapman, president Chapman Engineering Co., New York, by H. G. Siebert, fuel engineer Bethlehem Steel Corporation, Bethlehem, Pa., and by J. W. Jeffries, general sales manager Morgan Construction Co., Worcester, Mass.

Mr. Siebert, in his discussion, characterized the paper as one involving tremendous work on the part of the author. He stated that the best producers do not now gasify more than 20 lb. of coal per sq. ft. per hr. The chemical composition of the best gas from modern plants was given by Mr. Siebert as follows: Carbon dioxide 6.5, carbon monoxide 22, methane 3.5 and hydrogen 13 per cent, with a heat value of 140 B.t.u. per cu. ft. He stated that a content of 24 per cent of carbon monoxide is an exception. The speaker said that these low rates or values involve a great number of producers attended with heavy expense, and that good gas was possible in only one way—from the blast furnace type of producer, which gasifies 225 lb. per sq. ft. and gives gas having 0.50 to 2 per cent carbon dioxide and 33 to 30 per cent carbon monoxide, depending on whether air is used alone or a combination with steam, and that under such conditions an inferior fuel can be used.

### Ideal Fuel Economy

Ideal fuel economy in a large steel plant can be attained, said Mr. Siebert, "when we balance the conditions so that the use of bituminous coal may be confined to the by-product coke industry. The use of by-products, such as tar and gas supplemented by the gasification of coke in a small number of high capacity units of the ash slagging type, would make it possible to materially cheapen the construction of our open-hearth plants, because gas regenerators, complicated parts and reversing valves could be either eliminated or at least simplified. In his opinion, the future belongs to the gas producer of the blast furnace type.

### Oxygen in Gas Producers

J. W. Jeffries said in part that Mr. Dyrssen's paper will be regarded as a classic for many years to come. In his opinion the most forward looking thing in the paper was the reference to the use of oxygen in gas producers. "I think that the future of the gas industry is entirely tied up with the development of cheap oxygen." In regard to Mr. Dewey's reference that oxygen at $5 a ton would be a factor, the speaker said that this gas is now available in large quantities at less than half that price.

### Standardized Producer Tests

W. B. Chapman, president Chapman Engineering Co., New York, questioned the use of figures on temperature in the producer, except when they are thoroughly explained. He said particularly that the temperature at which the gas is made is something which must be subject to careful definition. The intense heat of the combustion zone, where $CO_2$ is produced, is far above the temperature of the zone above it, where this $CO_2$ is carbonized to CO at 2000 to 2200 deg. Fahr.

In his opinion, an instrument permitting accurate control of temperatures will be paid for inside a month's time, and thereafter will return in dividends every month an amount equal to its cost of installation. This results both from fuel saving and from improvement in gas quality, due to greater uniformity.

As to standardized producer tests, he questioned any policy of taking a single producer or a single set of conditions to establish a standard. He presented a standard set of tests based on an average of 12 tests taken from a number of different types of producers, including the Hughes, Morgan, Wood and Chapman. On this average he found a production of 154 B.t.u. on the "low value." With regard to B.t.u., he estimated that 97.5 per cent of the heat units in the producer gas come from the coal and 2.5 per cent from the steam. As to the outgo, the average of the 12 tests showed 74.6 per cent in cold producer gas, the sensible heat of which was about 11 per cent more. Unburned carbon in the ash accounted for 0.4 per cent, soot about 1 per cent, sensible heat carried away by cooling water 1 per cent, other small losses 1 per cent; while the remainder, or 11 per cent, represents radiation loss.

In Mr. Chapman's opinion, the differential between the hot bottom temperature and the relatively cool top temperature in the producer should be as great as it is possible to get—this in the interest of high gasification and economy. It is possible to get the temperature at the top of the fuel bed to as low as 1200 deg., while, of course, in the combustion zone it will be about 2500 deg. At the same time, the warning was voiced that the temperature across any horizontal plane within the producer should be uniform, and the density also uniform. Under these conditions blowholes cannot be formed, and the producer will work more evenly and with far better gas results.

## Chemistry in the Steel Industry

The paper by William A. Forbes, entitled "Value of Chemistry in the Iron and Steel Industry," was discussed by Bradley Dewey, Dewey & Almy Chemical Co., Cambridge, Mass. He characterized the paper as a comprehensive sketch which left little to be said. In his opinion the future value of chemistry in the steel industry was of paramount importance. With the science and knowledge of chemistry growing so rapidly, Mr. Dewey raised the question as to how the steel industry is to organize this growth. He stated that the specialized steel chemist will be the first to admit that he cannot give proper and adequate service to the daily operation and routine development of his organization and at the same time correlate and apply the possibilities of the specialized fields. Will an adequate visual picture of the make-up of the atom help the technology of steel? Who is going to tell us why 0.25 per cent copper retards the atmospheric corrosion of steel? Will it be a physical or a colloidal chemist?

### Oxygen in Steel Metallurgy

Mr. Dewey spoke of the prospects of obtaining oxygen for $5 a ton, and said that there would be a large use for this which would bring a host of problems to the steel industry, pointing to the possibility of making giant super power gas producers out of blast furnaces with pig iron as a by-product. The Bucher process for nitrogen fixation is showing more promise and is turning out pure iron as a by-product.

The chemical organization of the iron and steel industry of the future must make use of specialists in physics, physical chemistry, radio activity, metallography, absorption of gases, electrochemistry, thermodynamics, phase rule diagrams, and other similar fields.

## Waste in Steel Industry

J. V. W. Reynders, consulting engineer, New York, referred particularly to the waste attendant upon intermittent and variable production. He stated that the salable production of the steel industry dropped from $3,000,000,000 in 1920 to $600,000,000 in 1921—a drop of five to one within a single year. Contrasted with this, regardless of the perennial complaints of the farming community, he pointed out that when there is a short crop of farm products, prices are high, and vice versa, so that, on the whole, there is a substantial uniformity in the aggregate value of the crops from one year to another.

## Moisture in Fire Brick Linings

James H. France, general manager General Refractories Co., Philadelphia, in discussing the paper,

"Disintegration of Fire Brick Linings in Blast Furnaces," by Messrs. Nesbitt and Bell, stated that his theory of this phenomenon had for a long time been that when brick are put into the lining of a new furnace they contain considerable moisture, either inherent in the brick as made or incorporated during the process of lining the furnace, and that when such a furnace so lined is being heated up for drying a large part of the moisture is driven a certain distance into the lining of the furnace, resulting in damage to the brick in the shape of softening and weakening their structure, so that in time the lining becomes weak or falls apart. The authors, he said, have very ably shown that his theory lacked support, and he stated that he bowed to their skill and research ability, leaving it to others to decide this important point.

## Lake Iron Ore Shipments in May

Shipments of iron ore from the Lake Superior region in May were 6,671,705 gross tons, or 320.85 per cent more than in May, 1922, when the total was 1,585,305 tons. This is an increase of 5,086,400 tons for May, this year. In May, 1922, there was a decrease of 38.88 per cent from May, 1921. The comparative shipments by ports for May, 1922, and May, 1923, and for the season were as follows in gross tons:

| | May, 1922 | May, 1923 | To June 1 1922 | To June 1 1923 |
|---|---|---|---|---|
| Escanaba | 177,719 | 929,960 | 217,938 | 944,144 |
| Marquette | 70,125 | 288,668 | 70,125 | 288,668 |
| Ashland | 272,134 | 747,104 | 296,689 | 747,104 |
| Superior | 669,297 | 1,793,025 | 721,684 | 1,793,025 |
| Duluth | 217,062 | 2,027,300 | 236,062 | 2,027,300 |
| Two Harbors | 178,968 | 885,648 | 178,968 | 885,648 |
| Total | 1,585,305 | 6,671,705 | 1,721,466 | 6,685,889 |
| Increase | | 5,086,400 | | 4,964,423 |

The increase to June 1 this year is 288.38 per cent as compared with the same date in 1922, or 4,964,423 tons. A year ago there was a decrease as compared with 1921 of 1,048,772 tons. The Duluth and Superior percentage of the total to June 1 this year was 57.14 per cent against 55.63 per cent last year. The Escanaba proportion of the total was 14.13 per cent as compared with 11.66 per cent last year. Duluth's percentage of the total this year was 30.32 as compared with only 13.71 per cent to June 1, last year.

## Steel Shipments to Cuba

BIRMINGHAM, ALA., June 5.—The following is a specimen of some of the cargoes recently moving out of Mobile to Cuban points, one ship carrying this manifest: For Havana, 862,000 lb. of galvanized sheet steel, 42,000 lb. of corrugated iron, 1,000 tons of barbed wire, 20,000 lb. of staples, 99,000 lb. of steel beams and 185,000 lb. of nails; for Postillillo, 201 tons of rails, 23,000 lb. of splice bars and 2,000 lb. of bolts; for Matanzas, 150 tons of rails; for Antilla, 62,000 lb. of track spikes, 8,000 lb. of bolts, 97,000 lb. of splice bars and 865 tons of rails; for Puerta Tarafa, 124,000 lb. of angle bars, 1149 tons of rails, 15,000 lb. of bolts and nuts and 60,000 lb. of track supplies. Havana also took 40,000 lb. of steel bars and Cardenas 30,000 lb. of fence staples.

## Large Contract for Metal Fluming

WASHINGTON, June 5.—Forming an important item of this season's construction program in the Government's big irrigation project at Oliver is the award of one of the largest contracts for metal fluming ever placed in the province, says a report received by the Department of Commerce from Consul General Frederick M. Ryder, Vancouver, B. C. Over three miles of zinc flume will be constructed at a cost of about $68,000. The material is to be delivered at Oliver between July and August in sheets to form a circular flume, eight feet, three inches in diameter. All this sheet zinc will be imported flat, shaped and fabricated on the ground. In recommending the adoption of the sheet zinc for the metal flume, the Government engineers declared the zinc flume has a considerable advantage over a sheet steel flume.

## Secretary Hoover Approves Plan of American Construction Council

Secretary of Commerce Herbert C. Hoover has indorsed the plan of the American Construction Council, which seeks to flatten the menace of peaks and valleys throughout the year in the building industry. In short, it consists of gathering by a special department of the council of a vast amount of data from constructors and material manufacturers. To these will be added special statistics obtained from Government sources through the cooperation of Mr. Hoover's department and from the chambers of commerce throughout the country. Figures, analyzed and simplified by experts appointed by the council, will form the basis of a weekly forecast of construction conditions, so far as the demand and availability of material is concerned.

Among other things Mr. Hoover learned from the council that the country's building schedule, delayed since 1914, has reached fully $15,000,000,000, traceable chiefly to the skyrocketing of material and labor costs as the hitherto invariable accompaniments of seasonal building booms, and which equally invariably has caused boom collapses due to frightening away those who finance construction projects. With particular attention to the present crisis the council seeks to remedy this condition by "spreading the building peak over the year through the retarding of the most non-essential construction," though at the same time the added burden of delayed construction must be made up year by year.

Last year, it was shown, national construction totaled $4,000,000,000, but for the first four months of 1923 the demand showed a 40 per cent increase over the industry's capacity for the same period in 1922. The supply of materials for the period this year, however, was 16 per cent less than was required by the demand. It was emphasized that the council is "not trying to stop construction, but to do all possible to bring about a greater productivity and the employment of more men over a longer period."

The council's statement of plans reads in part:

"The purpose of the conference was to develop a practical way to keep constantly before the public not only the present actual conditions in regard to construction throughout the United States, but to forecast from reports received from many authoritative sources the probable conditions for several months ahead." Headquarters of the council have been opened at 62 West Forty-fifth Street, New York, and it is expected that the first of the week's forecasts will be given to the public not later than June 15.

## Strength of Zinc Roofing

In cooperation with the American Zinc Institute, the Bureau of Standards is carrying on an investigation to determine the safe load which can be placed on zinc roofing for a given spacing of the purlins. This information is greatly needed not only by builders but by manufacturers of corrugated zinc roofing. It is generally believed that reliable values for the safe loads to which roofing of this type can be subjected are not available. The question of the proper use of this material is of great economic importance and as zinc is used very successfully in Europe, it would seem that it ought to find a place in the roofing materials employed in this country.

Loading of freight cars from Jan. 1 to May 19 is reported by the car service division of the American Railway Association at 18,021,743, compared with 15,059,800 last year and with 14,082,546 in the corresponding period of 1921. In spite of the fact that there were 991,797 cars loaded in the week ended May 19—a new high record for this time of year and only 2½ per cent under the highest week in history—movement of cars has been sufficiently active to cut down car shortage figures below the number of surplus cars. The total shortage of May 22 is given as 20,585 cars, while the total surplus was 22,700 cars.

# GERMAN IRON AND STEEL

## Radical Changes in the Industry Follow Losses of Territory Containing Raw Material

Trade Information Bulletin No. 96 of the Department of Commerce, based on reports of C. E. Herring, Commercial Attaché, Berlin, details the situation in the German iron and steel industry, resulting from the territorial losses due to the peace treaty. Statistics are given of the output of various items of product in 1922, as compared with 1913, and the more immediate effects of the Ruhr occupation are traced. The following paragraphs are from the summary at the end of the bulletin.

Apart from the immediate critical situation occasioned by the French occupation and the determined passive resistance offered by the German Government and all classes of the German people in the Ruhr and elsewhere, there are certain basic post-war factors which will apparently diminish the pre-war competitive ability of the German steel industry in foreign markets. These include:

1.—Increased production costs and the possible politico-economic obstacles resulting from the transition of the German steel industry from a largely self-contained basis to the status of a finishing industry.

2.—Increased political power and class consciousness of German labor. Even widespread unemployment incident to a general business depression would perhaps not force organized labor to abandon permanently the shorter working day and the other social privileges gained through the revolution. Four years of real political influence upon the German Government has had a profound effect upon the psychology of German labor.

3.—Basic impoverishment of Germany resulting from the loss of her accumulated gold-value reserves (except as represented by physical, industrial and other equipment within the country) is reflected in an increasing shortage of working capital, which results in diminished credit facilities. The long credits which were an important factor in German foreign-trade extension before the war are no longer possible, although favorable credit terms may still be granted South American and other foreign importers in exceptional cases, owing to the common practice of maintaining high exchange reserves (which may be regarded largely as working capital) in foreign countries.

4.—The effective system of railway rebates and concealed export subsidies for key manufactures has been abandoned and, in the present bankrupt state of the German Government, can hardly be revived. Preferential internal transportation and ocean freight rates for exports were, before the war, an appreciable factor in the German manufacturers' export-trade development.

5.—Prospective shortage of iron and steel scrap is, of course, incident to the general after-war dependence on foreign raw materials, but it is particularly serious because the price of scrap is more apt to be artificially influenced by foreign embargoes, and otherwise, than the cost of Swedish, Spanish or other imported iron ores.

6.—Despite the declaration of the German Government that reparations obligations to France have been canceled by the occupation of the Ruhr, it may be assumed perhaps that some future arrangement contemplating an immediate or eventual evacuation of the Ruhr will revive, partially at least, German reparations obligations under the Versailles treaty. Apart from this possibility there are the reparations obligations to other Allied powers. Raising funds for future reparations payments is therefore a potential problem of German industry, which will presumably bear the chief burdens of the considerable additional taxes which any considerable reparations payments would imply.

7.—Coal difficulties of the German metallurgical industries, while doubtless considerable, are more susceptible to satisfactory solution than the coke shortage. Presumably France will make strong efforts to build up her own expanded metallurgical industries, which will mean that the pre-war supply of coke for Ruhr and other German steel plants will be permanently reduced.

8.—Continually changing production costs, delays in receipt of materials, etc., have resulted in a shifting price (Preise freibleibend) system for domestic trade and in increased prices and later deliveries of export shipments. This increasing uncertainty in connection with German orders has partly offset the lower price quotations and could hardly fail to result in a loss of good will among foreign consumers.

These disadvantages can be offset only by greater efficiency and productivity on the part of German labor and German technical and executive direction. There is little reason to suppose that the latter is much more effective than before the war, while the 8-hr. day has certainly not been offset by a proportionate increase in hourly production. The depreciated and rapidly declining German currency also has partly offset these after-war difficulties, but this cannot properly be considered as more than a temporary asset. Greater efficiency, as compared to pre-war standards (when basic conditions undoubtedly were more conducive to effective mass production and large export sales), is the only real solution, and it is hard to believe that this will be sufficient to restore the pre-war competitive ability of the German heavy industries.

## Fatigue Failure of Metal Parts Investigated

Millions of dollars annually is estimated as the financial loss to American industry caused by fatigue failure of metal parts, according to a report to the Engineering Foundation and the National Research Council by Prof. H. F. Moore, who has been conducting an investigation at the University of Illinois.

The principal cost of fatigue failure is said to be caused by the large numbers of minor accidents which necessitate replacement of broken parts, and which put machinery out of commission for a time, rather than by spectacular disasters. Careful study of the phenomena of fatigue failure might reduce this loss at least 50 per cent, it is stated. This study suggested would cover not only the properties of ferrous metals, but would also include the stresses set up in parts with irregular shapes. Another phase, characterized as probably of equal financial importance, deals with the possibility of using in stress-carrying machine parts metals which are not now used because their fatigue resisting properties are not known. The desirability in many cases of using non-corrosive, non-ferrous metals for making steam turbine blades is given as an example. The use of steel castings to replace steel forgings is also cited, one of the great drawbacks to the use of steel castings being said to be a lack of knowledge as to their fatigue resisting qualities. A study of the fatigue strength of steel castings is emphasized as offering a "promising field for the further extension of the use of steel castings and for the reduction of cost of complicated steel parts."

The investigation of fatigue of metals has been in full progress during the past year. The main lines of work covered include the investigation of fatigue of wrought ferrous metals under cycles of stress repeated but not reversed, study of the effect of heat treatment on fatigue strength of steel, the obtaining of further evidence for the existence of a definite endurance limit for wrought ferrous metals; and the beginning of work on non-ferrous metals. During the year the investigation has been financed almost entirely by the contributions of the General Electric Co. Contributions from the Allis-Chalmers Mfg. Co., the Western Electric Co., and the Copper and Brass Research Association have just become available, and a study of fatigue failure of non-ferrous metals will be a major feature of the investigation in the immediate future.

Reports of the progress of the investigation have been given in bulletins 124 and 136 of the engineering experiment station of the University of Illinois and in publications 4 and 6 of Engineering Foundation.

## Hydroelectric Work in Italy

Through the Ministers of Finance and Public Works, a loan of 65,000,000 lire has been arranged to promote the Sila hydroelectric development in Apulia and Calabria, together with similar enterprises in Southern Italy. This loan is being taken up by the Banco di Napoli, the Banco di Sicilia, and several large insurance companies, Commercial Attache H. C. MacLean reports to the Department of Commerce.

The three power companies on whose behalf the loan was effected are the Società Forze Idrauliche della Sila, the Società Meridionale de Elettricità, and the Società Generale Elettrica dell Sicilia.

Operation of the plant at Newton Falls, Trumbull county, Ohio, of the Peebles Engineering Co., Youngstown, Ohio, maker of railroad cranes, is being started. The crane produced by the company is for track laying and other railroad construction work. The present factory building, 60 x 300 ft., is located on a three-acre tract. Two other factory units, one 40 x 240 ft., and the other 50 x 100 ft., are planned. Later the company plans to engage in car repair work.

# British Iron and Steel Market

## Pig Iron Weakening — Heavy Decline in Cold Rolled Strip—Continental Conditions Improving but Buyers Wary

*(By Cable)*

LONDON, ENGLAND, June 5.

Pig iron is dull, with prices of the lower grades of Cleveland iron easier and makers anxious to secure forward business.

Hematite is weak, owing to diminished export demand. Foreign ore is quiet, Bilbao Rubio being quoted nominally at 23¾s. to 24s. ($5.49 to $5.55) ex-ship Tees.

There is improved demand for finished iron and steel, but few substantial orders are passing. Prices generally are easier, with some works keen sellers.

Clyde output for May was 10 vessels, with 17,210 tons gross register total.

Renewed offers of Belgian material have been made on settlement of the strike, but buyers are not keen to commit themselves. Belgian mixed specifications are being sold at £7 5s. ($33.50) f.o.b.

French authorities have seized large quantities of semi-finished steel in the Ruhr works.

In Belgium, the Société Anonyme Metallurgique de Sambre et Moselle, at Montigny-sur-Sambre, and the Société Anonyme des Laminoirs, Hauts-Fourneaux, Forges, Fonderies et Usines de la Providence, at Marchienne-au-Pont, were on the point of closing down when the strike ceased.

In Belgian Luxemburg three furnaces have been banked at Athus (Société Anonyme d'Athus-Grivegne); two furnaces at Musson (Société Anonyme des Hauts-Fourneaux, Fonderies et Mines de Musson) and two furnaces at Halanzy (Société Anonyme des Hauts-Fourneaux et Mines de Halanzy).

Practically all the yards are filled with accumulated stocks of rolled material.

In France, the Nord et Lorraine plant has blown in one furnace at Uckange and one furnace has been restarted at the Société Lorraine des Acieries de Rombas.

In Germany the strike in the Ruhr region on wage-increase has been settled and most works are now resuming operations.

Tin plate minimum price has been reduced to 23s. 1½d. ($5.34) basis, f.o.b., this figure being fixed until Sept. 30. The minimum price scheme has been fixed until Oct. 15, and possibly until the end of the year. The market is more active on general export buying, 23s. 4½d. ($5.40) basis, f.o.b., being paid fairly freely.

Sheet and tin plate bars have been fixed at £9 2½s. ($42.16) until the end of September.

There is a slightly improved demand for galvanized sheets. Black sheets are quiet.

We quote per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.62 per £1, as follows:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Durham coke, delivered | £2 | 4s. | to | £2 | 6s. | $10.17 | to | $10.63 |
| Cleveland No. 1 foundry | 6 | 9 | to | 6 | 10 | 29.80 | to | 30.03 |
| Cleveland No. 3 foundry | 6 | 0 | | | | 27.72 | | |
| Cleveland No. 4 foundry | 5 | 15 | | | | 26.57 | | |
| Cleveland No. 4 forge | 5 | 12½ | to | 5 | 15 | 25.99 | to | 26.57 |
| Cleveland basic | 6 | 0 | | | | 27.72 | | |
| East Coast mixed | 6 | 0 | | | | 27.72 | | |
| Ferromanganese | 18 | 0 | | | | 83.16 | | |
| Ferromanganese* | 20 | 0 | | | | 92.40 | | |
| Rails, 60 lb. and up | 10 | 0 | to | 10 | 10 | 46.20 | to | 48.51 |
| Billets | 8 | 15 | to | 9 | 15 | 40.43 | to | 45.05 |
| Sheet and tin plate bars, Welsh | 9 | 2½ | | | | 42.16 | | |
| Tin plates, base box | 1 | 3⅛ | to | 1 | 3½ | 5.34 | to | 5.43 |
| | | | | | | C. per Lb. | | |
| Ship plates | 10 | 0 | to | 10 | 10 | 2.06 | to | 2.17 |
| Boiler plates | 12 | 0 | to | 12 | 10 | 2.48 | to | 2.58 |
| Tees | 10 | 10 | to | 11 | 0 | 2.17 | to | 2.27 |
| Channels | 9 | 15 | to | 10 | 5 | 2.01 | to | 2.12 |
| Beams | 9 | 10 | to | 10 | 0 | 1.96 | to | 2.06 |
| Round bars, ¾ to 3 in. | 11 | 5 | to | 11 | 15 | 2.32 | to | 2.42 |
| Galvanized sheets, 24 g. | 19 | 0 | to | 19 | 5 | 3.92 | to | 3.97 |
| Black sheets, 24 gage | 14 | 0 | to | 14 | 10 | 2.89 | to | 2.99 |
| Black sheets, Japanese specifications | 15 | 5 | | | | 3.15 | | |
| Steel hoops | 11 | 0 | & | 13 | 0* | 2.27 | & | 2.68* |
| Cold rolled steel strip, 20 g. | 17 | 7½ | | | | 3.58 | | |
| Cotton ties, Indian specifications | 15 | 0 | | | | 3.09 | | |

*Export price.

### Continental Prices, All F. O. B. Channel Ports, Delivery as Specified

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Foundry pig iron: | | | | | | | | |
| Belgium, June, July | £5 | 15s. | to | £6 | 0s. | $26.57 | to | $27.72 |
| France, June, July | 5 | 15 | to | 6 | 0 | 26.57 | to | 27.72 |
| Luxemb'g, June, July | 5 | 15 | to | 6 | 0 | 26.57 | to | 27.72 |
| Billets: | | | | | | | | |
| Belgium, June, July | 6 | 15 | | | | 31.19 | | |
| Merchant bars: | | | | | | C. per Lb. | | |
| Belgium, July | 7 | 10 | | | | 1.55 | | |
| Luxemburg, June | 7 | 12½ | to | 7 | 15 | 1.57 | to | 1.60 |
| Joists (beams): | | | | | | | | |
| Belgium, July | 7 | 5 | | | | 1.50 | | |
| Luxemburg | 7 | 10 | to | 7 | 12½ | 1.55 | to | 1.57 |
| ¼-in. plates: | | | | | | | | |
| Belgium, June, July | 8 | 7½ | to | 8 | 10 | 1.73 | to | 1.76 |

## Industrial News Items

The Commonwealth Steel Co. has had under way at its plant at Granite City, Ill., an extensive construction program, already referred to in these columns. It includes a new pattern shop, an extension to the power house, with additions of electrical equipment and motor-driven compressors, a 400-ft. foundry extension, a 550-ft. core room extension and a new open-hearth furnace. These improvements will give a 35 per cent increase in output of steel castings. The additional 400 ft. gives a total length to the foundry of 1475 ft.

Samuel M. Vauclain, president Baldwin Locomotive Works, who has returned from a trip to Colorado, said that the company has $62,000,000 of unfilled business on hand and is operating at 95 per cent of capacity. Business booked from Jan. 1 to May 29 totaled $55,000,000, compared with $10,500,000 for the corresponding period of 1922.

The B. F. Sturtevant Co., Inc., Hyde Park, Boston, has purchased the plant of the Wisconsin Engine Co., maker of Corliss pumping engines, at Corliss, Wis. The acquisition covers nearly 10 acres, and the buildings afford approximately 150,000 sq. ft. of floor space. A full manufacturing and engineering staff will be maintained. E. M. Foss is president and Harry W. Page, for the past six years assistant general manager, becomes general manager and will have entire charge of the Wisconsin plant.

The Detroit Auto Body Corporation, recently incorporated to manufacture closed car bodies, has acquired the Andrew C. Sisman Co.'s plant on Beaufait and St. Paul Avenues, Detroit, as its first unit. The demand for closed bodies is so great that the capacity of this plant is already taxed and the company is negotiating for several other properties. Henry Brewster, one of the leading motor car body designers, has been secured as designer of the new company. He has recently been associated with the Pullman company of Chicago. With him will go Walter F. Thompson from the same organization, who leaves a position as manager of production of the Pullman Co. to be general manager of the Detroit Auto Body Corporation.

After meetings of the stockholders of both corporations, it was announced Tuesday, May 15, that the Trippensee Mfg. Co., Detroit, and the Everitt Bros. Corporation, of the same city, would be consolidated, and that terms for the immediate merging of these two companies had been agreed upon. The Trippensee company has two plants in Detroit and was incorporated in 1922 with a capitalization of $800,000. This company at the outset had contractual relations with the Fisher Body Co., but at the present time is producing bodies for the Chevrolet, Rickenbacker and other makes of cars. The Everitt corporation was incorporated in 1916 and operates one plant in Detroit, manufacturing automobile tops, and does a large amount of body trimming. Under the terms of the merger, the new corporation will be known as the Trippensee Closed Body Co., and all the plants of the two old companies will be utilized. The new merger retires Albert F. Trippensee, president of that corporation since its inception, and Albert W. Trippensee, vice-president. The new concern will have a board of directors of seven, four of whom will be from the Trippensee group and three from the Everitt stockholders. Frank J. Trippensee, at present secretary-treasurer of his company, has been agreed upon as president of the merged concern, with one of the Everitt brothers as chairman of the board and another as secretary-treasurer.

## GERMAN PIG IRON DOUBLED

### Price Raised to Offset Fall of Mark and Cover Enhanced Fuel Costs—Steel Also Higher

*(By Radiogram)*

BERLIN, GERMANY, June 4.—Foundry iron No. 1 has been advanced by the Pig Iron Association to 1,600,000 m. per metric ton ($20.48 per gross ton, at 1.26c. per 1000 m.) from 774,000 m. ($12.97 at 1.65c. exchange) last week. These figures replace the 714,000 m. ($16.32 at 2.25c. exchange) of May 14. It was $29.74 on April 9, with 1000 m. at 4.75c.

Much smaller increases have been made by the Stahlbund in prices of steel products. Ingots are now 1,445,000 m. ($18.50), in place of 1,271,000 m. ($21.30) a week ago, 899,000 m. ($20.55) on May 14 and 728,000 m. ($35.13) on April 16.

Steel bars are now quoted at 2,034,000 m. (1.16c. per lb), in place of 1,755,000 m. (1.31c. per lb.) last week, 1,250,000 m. (1.28c. per lb.) on May 14 and 1,012,000 m. (2.18c. per lb.) on April 16.

Thin steel sheets have been advanced to 3,265,000 m. (1.87c. per lb.) from 2,818,000 m. (2.11c. per lb.) a week ago, 1,971,000 m. (2.01c. per lb.) on May 14 and 1,596,000 m. (3.44c. per lb.) on April 16.

# France Getting More Fuel From the Ruhr

### Expects to Get Back to 50 Per Cent of Its Iron and Steel Production Rate Before Occupation—Results of the Policy of Seizure—The French Viewpoint

*(Special Correspondence)*

PARIS, May 17.—We do not intend to deal here with the political side of the problems connected with the present occupation of the Ruhr coal field. We shall limit ourselves to an exposition of the principal economic facts in that occupation.

When on Jan. 11, after the failure of the Paris conference, Franco-Belgian troops entered the Ruhr the object thereby pursued by the allied governments was twofold:

1. To secure a pledge which should compel Germany to meet her obligations under the peace treaty.

2. To obtain delivery of the quantities of Ruhr coke and coal necessary to French and Belgian industries, regarding which Germany had not supplied the full quota imposed on her by the commission of reparations.

#### The Franco-Belgian Industrial Mission

To aid in realizing the latter part of this program, a mission of French and Belgian engineers, joined by a few of their Italian colleagues, was sent to the Ruhr at the same time as the troops of occupation. For two or three days it was hoped that this "industrial mission," whose task was only to attend to the fulfillment of the prescriptions of the commission of reparations as regards fuel deliveries, would be able to accomplish its object quite peacefully and in agreement even with the Ruhr industrialists.

However, on Jan. 15, the Government of the Reich forbade German industrialists to make any delivery of coke or coal to France and Belgium, even against payment, and the Ruhr concerns immediately invoked this interdiction in repudiating the engagements they had made two days before to the industrial mission.

At the same time the Reich enjoined them, under threat of severe punishment, not to give any information to, nor to have any relation with, the authorities of occupation. The doors of the collieries and works were immediately closed against French and Belgian engineers, as were simultaneously the doors of the Essen stores against all Frenchmen, while electricity and gas supplies as well as telephonic lines were surreptitiously cut off.

#### German Resistance

So came to birth the system not of passive, but of aggressive resistance willed by the Reich, which included violence, sabotages and even murder among its modes of expression.

The mission of engineers was powerless before such a situation and, with the gradual defection of the railroad employees supervening soon after, and the suspension of work by all the Rhine bargemen of German nationality, no shipment to France or Belgium was possible. Moreover, the few trainloads of fuel which were requisitioned had been diverted en route from their destination.

Thenceforth the industrial mission, bent on carrying out its orders against all adverse circumstances, set to work silently preparing the ground for the fulfillment of the task assigned to it. On Feb. 1 a barrier was established to prevent any fuel from the Ruhr district from finding its way into unoccupied Germany. On Feb. 11, a like interdiction was enforced for other products.

#### French Plans for Seizing Fuel Stocks

The immediate aim of the mission was to seize at the mines and coke ovens the stocks that might exist there; but of such stocks there were none existing when we entered the Ruhr, and it was therefore necessary to have them reconstituted before attempting to tamper with them. Any premature move toward seizure would have had no other result than to stop work at the respective collieries and coke ovens.

Meanwhile, the industrial mission, notwithstanding all obstacles put in its way, was gathering very full information on the situation at mines and works in the Ruhr district, while occasionally cooperating in the seizure of shunted loaded trucks at various railroad stations.

On the other hand, the seizure of stocks could only begin when the railroads—operated by French and Belgian militarized railwaymen—should be able to handle the tonnage thus accruing and when sufficient military protection could be given to the gangs of men which were to proceed with the loading into trucks of the fuel taken from stocks.

#### Progress in Getting Fuel

This twofold condition was realized about March 25, and from that date on the operation of taking from the stocks was pursued energetically. The number of places (chantiers) at which it was carried on, which was only three on March 25, increased to seven on March 29, to 11 on April 1, to 18 on April 8, and since then has been further extended. Mechanical appliances, cranes, etc., in use on the fuel piles number now over 60. As part of these stocks was laid at abnormal emplacements, the operation of taking them away is sometimes a very difficult one, and in many cases special railroad tracks had to be laid for the purpose.

The following figures show how rapidly results were obtained:

*Tonnages Loaded into Trucks from Stocks in the Ruhr*

| Dates | Coke Metric Tons | Coal Metric Tons |
|---|---|---|
| March 24 | 1000 | 150 |
| March 25 | 1600 | 500 |
| March 31 | 2440 | 850 |
| April 4 | 3060 | 1150 |
| April 7 | 5370 | 1650 |
| April 11 | 6110 | 1910 |
| April 14 | 7440 | 2450 |

As regards coke, the tonnage now forwarded to France is exceeding one-half of the maximum ship-

ments made during the period of activity of the commission of reparations.

### Fuel Shortages Fall on Germany

The present operations, which were carefully prepared by the industrial mission and by the Franco-Belgian military and railroad authorities, acting jointly, have been carried on so far without any incident. All precautions have been taken by means of *pourparlers* with the coal owners and with the workers' delegates, against interruption of normal work at the mines. And when such work nevertheless was slowed down or interrupted this happened on the order of the Reich, which mistakenly believed that in this way it could influence French action.

A few batteries of coke ovens were indeed extinguished, but this did not harm France and Belgium. In all cases the Ruhr district will be required to supply to the allied countries the tonnages of reparation coal and coke to which they are entitled, and Germany alone, and the Ruhr industrial concerns in particular, will have to suffer from the shortage of production.

Let us hope, therefore, that the German workers will soon realize—as, indeed, most of the German industrialists have already realized—that the sabotage organization called into existence by the Reich's Government is preparing a long crisis of unemployment of which the workers will be the only victims.

### Coke Shipments Increasing

The stocks of coke which have been formally seized by the Franco-Belgian authorities and are to be shipped to France and Belgium aggregate 650,000 metric tons. But the occupying authorities and the industrial mission are aware of the existence in the Ruhr of concealed stocks of coke of about the same amount which, notwithstanding the methods used to hide them (covering them up with earth or slags, etc.), they have been able to locate and which, when the time comes, will be duly taken in hand.

Since the beginning of May, the Société des Cokes de Hauts Fourneaux (which is distributing coke supplies among French blast furnaces) has been receiving coke from the Ruhr at the daily rate of about 6000 tons.

We note below the quantities of fuel received by France from Germany during the past three months:

| | Feb. Metric Tons | March Metric Tons | April Metric Tons |
|---|---|---|---|
| Coal | 55,500 | 41,100 | 62,900 |
| Coke | 15,800 | 21,500 | 123,200 |
| Lignite briquettes | 1,800 | 3,600 | 3,400 |

As the French cannot send to the Ruhr a number of railroad men sufficient for an intensive working of the lines and as, besides, provision must be made for the transportation of German passengers and also for the food supplies of the Ruhr people, it is not to be expected that the quantity of coke and coal that can be shipped to France by rail and by water will exceed 20,000 tons per day. But, however reduced these shipments be, the time will come when the present stocks of coke will entirely run out, and it is reckoned that the first 650,000 tons of coke now effectively seized will be exhausted in about three months, after distribution between France, Belgium and Luxemburg.

Anyhow, it is certain that the French authorities have already elaborated a plan in anticipation of this eventuality. And if the French iron and steel industry cannot well hope to recover very soon the rate of production existing at the end of last year, it may at least be assured of maintaining a production of one-half and perhaps of two-thirds of the output of December, 1922.

### No Metal Products Seized

We may add that we have never requisitioned any metallurgical products in the Ruhr. A few truck loads of iron or steel products which were trying to run the blockade may have been seized by the occupying authorities and forwarded to France, where they were sold by the French Department concerned, but this cannot be called a requisition, any more than can the seizure, a few days ago, of a small quantity of rolled products because the German coal owners were refusing to pay the coal tax (kohlensteuer) into French hands.

### The Siege to Go On

Mr. Cuno's last note is not leaving room for any doubt about Germany's intention to pursue to the bitter end her policy of resistance to the obligation imposed upon her by the Versailles treaty. But France and Belgium are no less determined not to release the pledge they are now holding until Germany herself has acknowledged the uselessness of her resistance.

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## EXPORT MARKET QUIET

### Japanese Inquiries for Rails, Structural Steel and Sheets—Chinese Interested in Used Steel

NEW YORK, June 4.—Export trade continues quiet with a fair demand from South American countries. There is some official and semi-official purchasing for Japan. In addition to the tenders on rails recently reported, a number of requests for prices on structural material have been received by branches of Japanese exporters and importers in the United States. One of these structural steel tenders is for 800 tons of fabricated material for the First National Bank Building in Osaka and another is from a subsidiary company of one of the large Japanese companies, calling for about 300 tons of fabricated material. A recent cable asked for base prices, c.i.f. Japan, on about 1000 tons of structural steel, no specifications furnished. Sellers in this country consider the possibility of any but a small part of this steel being placed with American mills as extremely doubtful, in view of the stocks carried by the Imperial Government Steel Works and the probability of British competition. British sellers seem to be in a position to quote from $50 to $60 per ton, c.i.f. Japanese port. American exporters have been submitting bids on about 200 tons of electrical sheets for the Hatchi Engineering Co., Japan.

Chinese purchases of wire shorts are still at a low ebb, although there seems to be a fairly large tonnage of shorts available in this country for export. Price is undoubtedly an obstacle, as it is also a hindrance to business in second hand plates. Chinese buyers in most instances seem to expect quotations of about $30 per ton, c.i.f. Chinese port, on second hand plates in good condition, without holes. One exporter in New York has been offering a lot of several thousand tons of second hand ship plates, punched, at about $32.50 per ton, c.i.f. China, but with no taker at this price.

No substantial change is reported in prices of foreign pig iron, either Scotch foundry and Continental iron, although a recent decline in the exchange rate on the franc brought the c.i.f. price for importers to $30 to $31 per ton, Atlantic port. While this is slightly lower than previous quotations, it is considered too high to interest American consumers and is only temporary, caused by the downward movement in exchange. Scotch foundry is still quoted at about $32 per ton, c.i.f. Atlantic port, for No. 3.

Thus far, quotations on coke, submitted by exporters to European consumers, have not resulted in business. One exporter and importer, however, reports the recent sale to a German consumer of 500 tons of by-product coke, guaranteed to be harder than coke furnished on previous shipments. The lot is a trial tonnage, which, if found satisfactory by the buyer, may result in a contract for several thousand tons a month.

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A pamphlet has recently been issued by the University of Michigan, Ann Arbor, Mich., descriptive of the course in chemical engineering and the improved facilities which are to be offered for graduate work in the new east engineering building, which is to be ready for occupancy next fall. The pamphlet is available to anyone desiring it by addressing Alfred H. White, professor of chemical engineering at the university.

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ESTABLISHED 1855

# THE IRON AGE

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## Handicapped Machine Tool Building

Machine tool building as an industry, hampered by its feast-and-famine habit, has suffered again from the bidding away of labor from its shops, particularly by its customers of the mass production class. Too many machine tool builders seem to lack the decision, shown by their competitors in the labor market, to put prices where costs are fully covered, as should be possible in times of good demand. One handicap is that they are the last to receive the impulse of a boom and often are the first to feel the industrial slump. And their problem of keeping in continuous operation is complex. Yet they must have mechanics of the highest order.

It is traditional for "the makers of the master tools of industry" to give attention to apprentice work and to the training of machinists. On the other hand, the mass production plants, with their highly subdivided processes, have stressed output and put their main dependence on workers capable of operating a single type of machine on a limited variety of work. Training within the plant takes a subordinate place, and when an increase in forces is necessary the machine tool plants are the most likely source of supply.

What the machine tool builder could wish for is a stiffer attitude among his fellow manufacturers, to the end that their products should bring a profitable margin, and a better understanding among buyers of the cost factors which justify the prices asked.

One factor in labor costs, in the face of restricted immigration, is the drift of workers to pursuits which take them from the factories. Statistics show unmistakably how greatly labor-saving and material-handling machinery is compensating for labor deficiencies and how much more must yet be done in the direction of replacing manual labor with machinery. In the decade ended in 1920 the population of the United States increased 15 per cent, but labor available for industry increased only 4 per cent. There is the anomaly that the very reduction in percentage of factory workers gives rise to the necessity of mechanical appliances which in turn creates demand on the labor-depleted factories.

In 1919 there were 9 million wage earners, or 2 million more than in 1914. The excess of immigration over emigration was only ½ million, so that the increase must represent in the main migration from the farms to the cities. In the face of heavy declines in the number of laborers on the farms, crop yields have been increasingly larger, due to the introduction of labor-saving machinery in agriculture.

If American manufacture is to go on expanding, the annual increase in factory workers should average fully as high as for the 15 years before the war. Then it amounted to 155,000 per year. The farms can ill afford to supply more factory workers and of course no relief is to be expected from the present immigration law. Under it the quota is about 358,000 per annum, but half of these are women, and of the remainder none too many enter factories. If it were possible to adopt the suggestion made by the Chamber of Commerce of the United States to allow an additional 2 per cent of selective immigration, to meet each definitely known emergency for a given industry, the outlook would be brighter. Then the proposal that the United States and the industries affected advertise in the countries from which labor is desired would be worth considering.

Few are optimistic enough to look for any early change in the immigration law favorable to industry. Thus the chief hope lies, as in the past, in inventions and mechanical improvements. As conditions stand, the metal-working industries have labor problems second to those in no other field, and the machine tool builders are a group for which a propaganda in respect to labor supply and price fairness is especially in order.

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Two important references to oxygen in steel metallurgy are found in the discussion of the technical papers of the American Iron and Steel Institute, abstracted on other pages. In the view of one commentator, the most forward-looking feature in the paper on gas producers was the reference to the use of oxygen in their operation. Indeed, he considered that "the future of the gas industry is tied up entirely with the development

of cheap oxygen." Another speaker of high competence was of the opinion that with the advent of cheap oxygen it would find a large use in the industry and pointed to the possibility of making giant super-power gas producers out of blast furnaces, with pig iron as a by-product. These are arresting statements, but not beyond the pale of probability. The Bureau of Mines is making extensive investigations of the application of oxygen to metallurgy, and the expectation of a valuable report is not likely to be disappointed. The history of many once expensive materials suggests that cheap oxygen is only a matter of time.

## What Is Alloy Steel?

There is some difference of opinion as to just what an alloy steel is. At the convention of electrochemists in New York last month the view was given prominence that "alloy-treated steels" are decidedly different from alloy steels and that unless radical or revolutionary properties are bestowed on a steel by the addition of an alloying element, the resulting product should be considered as an alloy-treated steel rather than as alloy steel. But who shall decide what properties are revolutionary?

Manifestly the effort to maintain such a distinction would result in great confusion, statistically and otherwise. There are many steels having marked physical properties which contain only small percentages of an element such as vanadium, molybdenum or zirconium. Chromium also and some other metals enter into certain special steels in only small percentages. The contention of some that an alloy steel must contain fairly large proportions of the alloying metal is not a practicable basis for definition.

Back in 1912, the International Association for Testing Materials received at its sixth congress in New York a report from its committee on uniform nomenclature of iron and steel. In it is included this definition of alloy steel: "Steel which owes its distinctive properties chiefly to some element or elements other than carbon, or jointly to such other element and carbon." Accompanying the definition is this "remark" by the committee: "Some of the alloy steels necessarily contain an important percentage of carbon, even as much as 1.25 per cent. There is no agreement as to where the line between the alloy steels and the carbon steels shall be drawn."

It may be recalled that this nomenclature report of 1912 caused a division in the committee over the definition of steel, the British members dissenting from the proposal of the chairman, the late Henry M. Howe. However, the British members were in entire agreement with the majority in respect to alloy steel and, while the report as a whole failed of adoption, the definition of alloy steel may be accepted as representing the consensus of the best metallurgical opinion of the steel-making countries. The eleven years following the New York congress of 1912 have brought many important developments in the manufacture and use of alloy steels. It is to be questioned, however, if these furnish adequate reason for such a change in nomenclature as was advocated at the recent meeting of the electrochemists.

## More Efficiency in Production

It is recognized on all hands that in the past few months manufacturing operations of all sorts have proceeded with great smoothness and efficiency. Production has been the greatest in the history of the country, although population has increased but little of late and the hours of labor are, if anything, shorter than formerly.

The efficiency of labor, or the will to work, is commonly reported as being greater than at any time in seven years. The increased output per man in the steel industry, as already commented on in these columns, is a conspicuous example. Some observers hold that efficiency is not so great, in certain lines of work, as just before the war, but there is no substantial reason for expecting such a return. The will to work was not so great in 1913 as it was 25, 50 or 100 years earlier. It would be idle to ignore this general principle that as inventions multiply and comfort increases men insist upon taking things easier. We shall do well to conclude that we have substantially a return to normal in the matter of efficiency and willingness to work, in the case of the manufacturing industries, to which alone reference here is made. We need not expect much further improvement.

It is the conclusion of well-posted observers, as was indicated, for instance, in the May Federal Reserve Bulletin, that heavy production tending to reduce unit cost has offset, sometimes more than offset, higher cost of raw materials, so that production is on an economical basis. The losses of 1921 and the meager profits, if any, of 1922, are followed by substantial but not unreasonable profits.

As to manufacturing in general we now have a condition representative of real prosperity, and a substantial prosperity in that it has capacity to propagate itself. The profits and wages obtained are continually creating buying power whereby the demand for manufactured goods should continue.

In this general field of manufacturing we have what may reasonably be referred to as an ideal condition, not merely a good one for the present but a promising one for the future. Our activity, however, is not confined to manufacturing. We do, or desire to do, a great deal of constructing, of building. The increase we have had in the physical wealth of the country, great and practically continuous up to about the time we entered the war, has been due chiefly to construction, represented by the investment of our savings. Continuance of prosperity depends upon increase in these facilities. When we do not go forward we really go backward, because we expect more and more comfort year by year, supplied only by these facilities.

It is necessary to our welfare that construction work be done efficiently and at reasonably low cost. Every one recognizes that this condition does not now obtain; that, whereas there is

efficiency in manufacturing, in the production of goods, there is not efficiency in construction operations. The contrast is striking and the divergence has been growing more pronounced month by month.

It is this divergence that constitutes the weakest thing in the present economic structure. The weakness is to be seen from several different angles. Our physical wealth increases chiefly by the investment of our savings. One may invest the savings of past years or the expected savings of future years. It may be that too much is being paid for what is received. It may be that demand for construction work will decrease and then with less spending there may be less demand for manufactured goods, even though these goods are produced cheaply enough.

## Government Owned Railroads

Government ownership of the railroads is both a political doctrine and a desire of the railroad workers. The two are interwoven. The politicians who desire Government ownership may not have as their sole reason the chance it would give them to bid for votes by their conduct when in office. But presumably that is one motive. On the other hand one reason for a railroad worker's desiring Government ownership is that his vote would have value in determining his working conditions and remuneration.

The "conference on valuation of the railroads" held in Chicago recently purported to represent an effort to secure a "fair valuation" in the interest of the public; but a scrutiny of the list of those who attended shows that the meeting was made up largely of those who are strongly in favor of Government ownership. Although it was such a man as Senator La Follette who was largely responsible for the law by which the present valuation is being conducted, this valuation was severely attacked.

The alinement of this thing is easily seen. If the valuation is reduced, ostensibly in the interest of lower rates to be paid by the public, railroad credit is correspondingly impaired. The valuation can be reduced sufficiently to destroy the possibility of American railroading succeeding under private ownership, and Government ownership would thus be forced.

Many well-poised observers believe that the attacks upon the valuation are simply efforts to bring about Government ownership. The American citizen who wishes to form a proper opinion on this subject has before him, to set against each other, two things: On the one hand, the advantage to the public of such lower rates as might be brought about by a lower valuation; on the other hand, the greater expense of operation under Government ownership, which might bring about higher charges.

In each of these two points much is involved, but the first thing that the citizen should note is the quantitative relation between valuation and railroad payroll in the matter of fixing charges. This relation can be computed very easily. It is not necessary to use exact figures. The valuation, as things are going—and it is the way things are going that is attacked—will be in the neighborhood of 19 billion dollars. The rate of return now governing the Interstate Commerce Commission, but which is by no means a guarantee, is 5¾ per cent, which means on the valuation mentioned about $1,100,000,000 a year. The payroll of Class I roads in the first three months of this year was at an annual rate not far from $3,000,000,000. The ratio between these two figures is 37:100. The first is about three-eighths of the second. To the public, the payroll is much more important than the valuation.

By the working out of this ratio, an increase or decrease of 10 per cent in the valuation would have the same effect upon the total to be collected from the public in rates as would an increase or decrease three-eighths as large, or 3¾ per cent, in the payroll. The average man can judge what would be the effect of Government ownership upon the payroll. He ought to be able to judge also what would be the effect upon railroad credit of a reduction in the railroad valuation. It is railroad credit that will determine whether private ownership can continue.

## Success of Employee Representation

Evidence accumulates of the success of employee representation plans. The recent report of the Cleveland Chamber of Commerce, as liberally abstracted in THE IRON AGE, indicated clearly that, despite a few failures, much has been accomplished in that city in establishing more cordial relations of employers and employees.

A conspicuous example of success has been furnished in the plants of the Standard Oil Co. of New Jersey. After a five-year test, officials and employees alike testify to the satisfactory results obtained. At a recent meeting at which both employers and employees were represented, Chairman Bedford explained the operation of the plan and said that only through square dealing with employees and with the public could the company hope to continue a prosperous business. Harry J. Clancey, representative of the Eagle works of the company, said that the plan was conceived by broadminded men who knew when they adopted it that it meant open diplomacy and that the workmen would be placed in a position to obtain all the facts pertaining not only to the company but to the entire industry. Mr. Clancey said further:

> Ten years ago if a man had suggested that the officials would tell the workers about the profits and the losses of the company he would have been examined for lunacy. But times have changed; today the officials gladly explain in minute detail the ups and downs of business. As a result, the worker and management are enabled to give the consumer honest value for his money; the worker without striking gets the prevailing rate, and the management gains by receiving something it has vainly endeavored to get for a century—cooperation. In this plan we are reaping the rewards of thorough understanding between the parties concerned. We realize that we are never going to have to pay the penalty that is so often paid where agreements are entered into by rule of force. In our indus-

trial representation plan we have the rule of reason, and it gets the worker more in one week than force would get in a year, and it does not cost us months of enforced idleness to get it.

## CORRESPONDENCE

### What Is Alloy Steel?—The Case of Vanadium

*To the Editor:* In THE IRON AGE of May 10, containing a review of the proceedings of the American Electrochemical Society's recent meeting, reference is made to the discussion of Dr. Gillett's paper and the questions of nomenclature and scavenging effect of elements in alloy steels are brought out. The writer believes that some of the remarks are apt to cause erroneous impressions in regard to the purpose of additions of certain elements, such as molybdenum and vanadium, mentioned in the discussion, and also to distort the true picture of the function of alloys in steel.

The question of nomenclature seems to be perfectly well defined and established at present. When the engineering profession talks about plain carbon steel, it has in mind a well-defined composition. If silicon and manganese are present, they are under the limits at which they begin to exert an appreciable influence on the physical properties. So are also chromium, nickel, copper and other elements invariably persistent in all present-day steels, being accumulated from the scrap used. However, their percentages are under the effective limits. These are merely considered as adjuncts and are not utilized in the physical specifications of the steel.

On the other hand, when the engineer talks of chrome-nickel or chrome-vanadium, or chrome-molybdenum steels he pictures in his mind the analyses. He talks of high nickel-chrome and low nickel-chrome. He knows just what physical properties are represented by these analyses and nomenclatures. It is the physical properties he is concerned with and the composition to him is of secondary importance. We have the S.A.E. numbers and they represent not only compositions but the engineering properties to us.

To deviate from the present usage of differentiating plain-carbon steels and alloy steels seems, therefore, superfluous; and to call some alloy steels "alloy-treated" steels is not only superfluous but actually erroneous. In the example cited of vanadium steel, it is not the vanadium doing the treating or so-called scavenging that imparts to the steel the better physical properties. It is the vanadium that has escaped the so-called treating or scavenging that does the useful work. If a steel with sufficient oxides in it to combine with all the vanadium added to it were thus treated with vanadium the resulting metal would not show any of the physical properties of vanadium steel and it would not be vanadium steel.

The amount of vanadium required in the finished steel to bring about the physical properties is small, about 0.15 to 0.18 per cent, not because it is residual from a tolerably large quantity added to do the scavenging. On the contrary, in good steel making practice the quantity added is figured very closely to the quantity left in steel, which is natural when we consider the cost of vanadium; so that, when the better physical properties are found in the finished steel, they could not be due to the scavenging, as very little scavenging if any could have been possible under the circumstances.

The truth of the matter is that vanadium is a carbide-forming element and that it brings about the physical properties in steel by its action on the carbide. Now, the carbon content of a steel might be 0.25 to 0.50 per cent together with a vanadium content of 0.15 to 0.18 per cent. Thus we can readily see that the quantity of vanadium is a very large percentage of the carbon and therefore can exert the remarkable influence on the carbides that it does. The function of alloys is primarily to change the reactions between iron and carbide in thermal changes, and vanadium-carbide, or chrome-vanadium-carbide, or chrome-molybdenum-carbide enters into these reactions entirely differently from plain iron-carbide.

The scavenging action is a secondary phenomenon and an economic evil in alloy steel making. Further, the writer is inclined to believe that the scavenging or combining with oxygen in the case of vanadium does not take place so readily in the presence of carbon. Vanadium has extremely great combining power with carbon at high temperatures and it is doubtful if vanadium carbide will give up its carbon and combine with oxygen derived from liquid oxides present. According to the scavenging theory, if vanadium were combining with oxygen so readily we should always expect perfectly clean steel when vanadium was present in the finished metal. We know this is not always the case.

B. D. SAKLATWALLA,
General Superintendent Vanadium Corporation of America
Bridgeport, Pa., May 19.

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### Remodeling Plant of Savage Arms Corporation at Sharon, Pa.

Work now is in progress of remodeling and equipping the old plant of the Savage Arms Corporation at Sharon, Pa., which was acquired by the Westinghouse Electric & Mfg. Co. several months ago. It is expected the changes will be completed by early fall. The transformer division of the East Pittsburgh, Pa., works of the company then will be transferred to Sharon.

All types of transformers, from the very smallest to some of the largest in the world, eventually will be made at the Sharon plant. This will involve the transportation and installation of a large amount of machinery and testing equipment. Among the operations to be performed in the construction and assembly of transformers are the drawing and forming of steel for tanks, the winding of coils, stamping of metal for cores, the manufacture of insulating bushings and the testing of the complete units. This testing will necessitate the use of extremely high voltages.

C. H. Champlain, who has been assistant works manager at the East Pittsburgh works, has been appointed works manager of the Sharon plant and M. L. Fawcett, general foreman of the transformer department, has been made superintendent of the new works. Both officials are now engaged in directing the work of fitting the new plant for the manufacture of transformers. Mr. Champlain entered the employ of the company in 1895. From Jan. 1, 1916, until August, 1919, he was general superintendent of the Springfield, Mass., plant, in which position he had direct charge of the manufacture of Russian rifles and Browning machine guns. Mr. Fawcett has been with the company since 1899.

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### Basing Point Hearing at Pittsburgh

PITTSBURGH, June 5.—The Federal Trade Commission hearing in the Pittsburgh basing point controversy will start here tomorrow morning in the Federal Building, at 10 o'clock. This hearing is in connection with the Steel Corporation side of the case, and officials of the Steel Corporation subsidiaries, as well as those of independent companies in this district, will testify.

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The shipbreaking industry in Germany has been very prosperous, up to the present time, according to *Engineer* (London), the end of the war and the Washington disarmament convention having brought a large number of old warships into Germany to be broken up. The Wilhelmshaven shipbreaking yards had developed considerably, and twenty-five other yards produce some 40,000 tons of scrap iron and steel a month. The prosperity of these yards is now greatly waning, and a certain number of them have been transformed into shipbuilding yards, the breaking up of old merchant ships being less profitable than that of war vessels.

# MAY PIG IRON OUTPUT

## Exceeds Any Previous Record—Gain Over April 6440 Tons Per Day

### Fourteen Furnaces Blown In and Three Blown Out—Net Gain of 11

For the third month in succession the blast furnace production of the country has exceeded any previous record. The May output has topped all war or post-war achievements, both in totals and in daily rate. At 3,867,694 gross tons the production last month was 317,958 tons in excess of the April make and at 124,764 tons per day it surpasses the previous month by 6440 tons per day.

Production of coke and anthracite pig iron for the 31 days in May amounted to 3,867,694 tons or 124,764 tons per day as compared with 3,549,736 tons or 118,324 tons per day in April, a 30-day month. In March, a 31-day month the output was 3,523,868 tons or 113,673 tons per day. There were 14 furnaces blown in during May and 3 blown out, a net gain of 11, against a net gain in April of 14. The net gain in furnaces since March 1, or in 3 months, has been 43.

The total number of furnaces in blast on June 1 was 321 as compared with 310 on May 1. The capacity of the 321 furnaces operating on June 1 is estimated at 125,100 tons per day as compared with 119,500 tons per day for the 310 furnaces in blast on May 1, or an increase of 5600 tons per day.

The ferromanganese output in May was 19,568 tons against 20,808 tons in April. The spiegeleisen made last month was 9533 tons as compared with 7440 tons in April.

#### Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from May, 1922, is as follows:

*Daily Rate of Pig Iron Production by Months—Gross Tons*

| | Steel Works | Merchant | Total |
|---|---|---|---|
| May, 1922 | 60,619 | 13,790 | 74,409 |
| June | 62,534 | 16,167 | 78,701 |
| July | 62,295 | 15,297 | 77,592 |
| August | 45,672 | 12,914 | 58,586 |
| September | 53,856 | 13,935 | 67,791 |
| October | 66,060 | 19,032 | 85,092 |
| November | 72,177 | 22,813 | 94,990 |
| December | 75,179 | 24,398 | 99,577 |
| January, 1923 | 79,991 | 24,190 | 104,181 |
| February | 80,684 | 26,251 | 106,935 |
| March | 87,881 | 25,792 | 113,673 |
| April | 90,145 | 28,179 | 118,324 |
| May | 96,029 | 28,735 | 124,764 |

#### Production of Steel Companies—Gross Tons

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies, as well as from merchant furnaces producing ferromanganese and spiegeleisen, show the foregoing totals of steel making iron, month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

*Production of Steel Companies—Gross Tons*

| | Total Production 1922 | Total Production 1923 | Spiegeleisen and Ferromanganese 1922 Fe-Mn | 1922 Spiegel | 1923 Fe-Mn | 1923 Spiegel |
|---|---|---|---|---|---|---|
| Jan. | 1,306,045 | 2,479,727 | 6,874 | 1,230 | 19,358 | 12,056 |
| Feb. | 1,311,170 | 2,259,154 | 3,610 | 4,930 | 21,383 | 3,657 |
| Mar. | 1,629,982 | 2,724,305 | 11,600 | 2,095 | 20,730 | 13,832 |
| Apr. | 1,707,902 | 2,704,360 | 14,998 | 4,211 | 20,808 | 7,440 |
| May | 1,879,180 | 2,976,892 | 15,432 | 4,902 | 19,568 | 9,533 |
| June | 1,876,033 | ..... | 18,273 | 4,817 | ..... | ..... |
| July | 1,931,138 | ..... | 18,873 | 7,176 | ..... | ..... |
| Aug. | 1,415,832 | ..... | 11,402 | 7,925 | ..... | ..... |
| Sept. | 1,615,696 | ..... | 10,681 | 4,235 | ..... | ..... |
| Oct. | 2,047,873 | ..... | 9,193 | 12,283 | ..... | ..... |
| Nov. | 2,165,295 | ..... | 13,232 | 4,192 | ..... | ..... |
| Dec. | 2,330,545 | ..... | 17,007 | 10,591 | ..... | ..... |
| Total | 21,216,691 | ..... | 151,175 | 68,587 | ..... | ..... |

Among the furnaces blown in during May were the following: One Lackawanna furnace of the Bethlehem Steel Co., one Niagara furnace of the American Radiator Co. and one Susquehanna furnace of Rogers, Brown & Co., in the Buffalo District; the Lochiel furnace in the Lower Susquehanna Valley; the Dunbar furnace in western Pennsylvania; the Goshen furnace in Virginia; the Anna and McKeefrey furnaces in the Mahoning Valley; the Ironton furnace of the Marting Iron & Steel Co. in southern Ohio; No. 1 Joliet furnace and South Chicago E furnace of the Illinois Steel Co. and one Calumet furnace in Illinois; one Detroit furnace in Michigan and No. 2 City furnace of the Sloss-Sheffield Steel & Iron Co., in Alabama.

Among the furnaces blown out or banked during May were the following: The Robesonia furnace in the Lebanon Valley; D furnace of the Bethlehem Steel Co. at Sparrows Point, Md., and the Cumberland furnace in Tennessee.

#### Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces for May and the three months preceding:

*Pig Iron Production by Districts, Gross Tons*

| | May (31 days) | April (30 days) | March (31 days) | Feb. (28 days) |
|---|---|---|---|---|
| New York | 266,658 | 235,553 | 226,668 | 181,215 |
| New Jersey | 24,605 | 18,758 | 12,551 | 12,740 |
| Lehigh Valley | 93,493 | 87,366 | 83,690 | 69,877 |
| Schuylkill Valley | 123,061 | 108,744 | 97,065 | 84,763 |
| Lower Susquehanna and Lebanon Valleys | 64,609 | 46,682 | 44,558 | 36,147 |
| Pittsburgh district | 789,330 | 769,672 | 790,708 | 624,331 |
| Shenango Valley | 169,708 | 146,032 | 136,502 | 124,736 |
| Western Pa. | 221,369 | 199,177 | 180,926 | 148,330 |
| Maryland, Virginia and Kentucky | 107,613 | 103,245 | 109,253 | 84,310 |
| Wheeling district | 157,071 | 146,303 | 134,026 | 115,511 |
| Mahoning Valley | 383,068 | 362,843 | 383,469 | 325,275 |
| Central and Northern Ohio | 309,261 | 298,797 | 319,774 | 296,168 |
| Southern Ohio | 77,402 | 60,344 | 51,186 | 49,426 |
| Illinois and Indiana | 646,913 | 556,223 | 534,680 | 462,376 |
| Mich., Minn., Mo., Wis. and Colo. | 160,456 | 144,723 | 140,354 | 130,361 |
| Alabama | 249,810 | 241,674 | 254,239 | 227,254 |
| Tennessee | 23,267 | 23,600 | 24,219 | 21,367 |
| Total | 3,867,694 | 3,549,736 | 3,523,868 | 2,994,187 |

#### Capacities in Blast June 1

The following table shows the number of furnaces in blast June 1 in the different districts and their capacity, also the number and daily capacity in gross tons of furnaces in blast May 1:

*Coke and Anthracite Furnaces in Blast*

| Location of Furnaces | Total Stacks | June 1 In Blast | June 1 Capacity per day | May 1 In Blast | May 1 Capacity per day |
|---|---|---|---|---|---|
| *New York:* | | | | | |
| Buffalo | 22 | 20 | 8,100 | 17 | 7,250 |
| Other New York | 4 | 3 | 680 | 3 | 595 |
| New Jersey | 4 | 2 | 790 | 2 | 625 |
| *Pennsylvania:* | | | | | |
| Lehigh Valley | 16 | 8 | 2,770 | 8 | 2,700 |
| Spiegel | 2 | 2 | 245 | 2 | 210 |
| Schuylkill Valley | 15 | 11 | 3,970 | 11 | 3,625 |
| Lower Susquehanna | 9 | 6 | 1,765 | 5 | 1,760 |
| Ferromanganese | 1 | 1 | 75 | 1 | 70 |
| Lebanon Valley | 6 | 1 | 140 | 2 | 225 |
| Ferromanganese | 2 | 1 | 45 | 1 | 50 |
| Pittsburgh district | 55 | 54 | 25,065 | 54 | 25,200 |
| Ferro and spiegel. | 4 | 4 | 395 | 4 | 415 |
| Shenango Valley | 19 | 14 | 5,470 | 14 | 5,160 |
| Western Pennsylvania | 26 | 20 | 7,140 | 19 | 6,640 |
| Maryland | 5 | 4 | 1,895 | 5 | 1,920 |
| Ferromanganese | 1 | 1 | 85 | 1 | 85 |
| Wheeling district | 15 | 12 | 5,065 | 12 | 4,900 |
| *Ohio:* | | | | | |
| Mahoning Valley | 28 | 28 | 12,355 | 26 | 11,930 |
| Central and Northern | 26 | 21 | 9,975 | 21 | 9,720 |
| Southern | 16 | 10 | 2,495 | 9 | 2,090 |
| Illinois and Indiana | 42 | 40 | 20,865 | 37 | 19,190 |
| Mich., Wis. and Minn. | 12 | 11 | 3,910 | 10 | 3,620 |
| Colorado and Missouri. | 6 | 3 | 1,260 | 3 | 1,200 |
| *The South:* | | | | | |
| Virginia | 18 | 6 | 855 | 5 | 770 |
| Kentucky | 7 | 3 | 700 | 3 | 720 |
| Alabama | 39 | 27 | 8,145 | 26 | 7,950 |
| Ferromanganese | 1 | 1 | 95 | 1 | 100 |
| Tenn., Ga. and Texas | 16 | 7 | 750 | 8 | 780 |
| Total | 417 | 321 | 125,100 | 310 | 119,500 |

The figures for daily average production, beginning with January, 1917, are as follows:

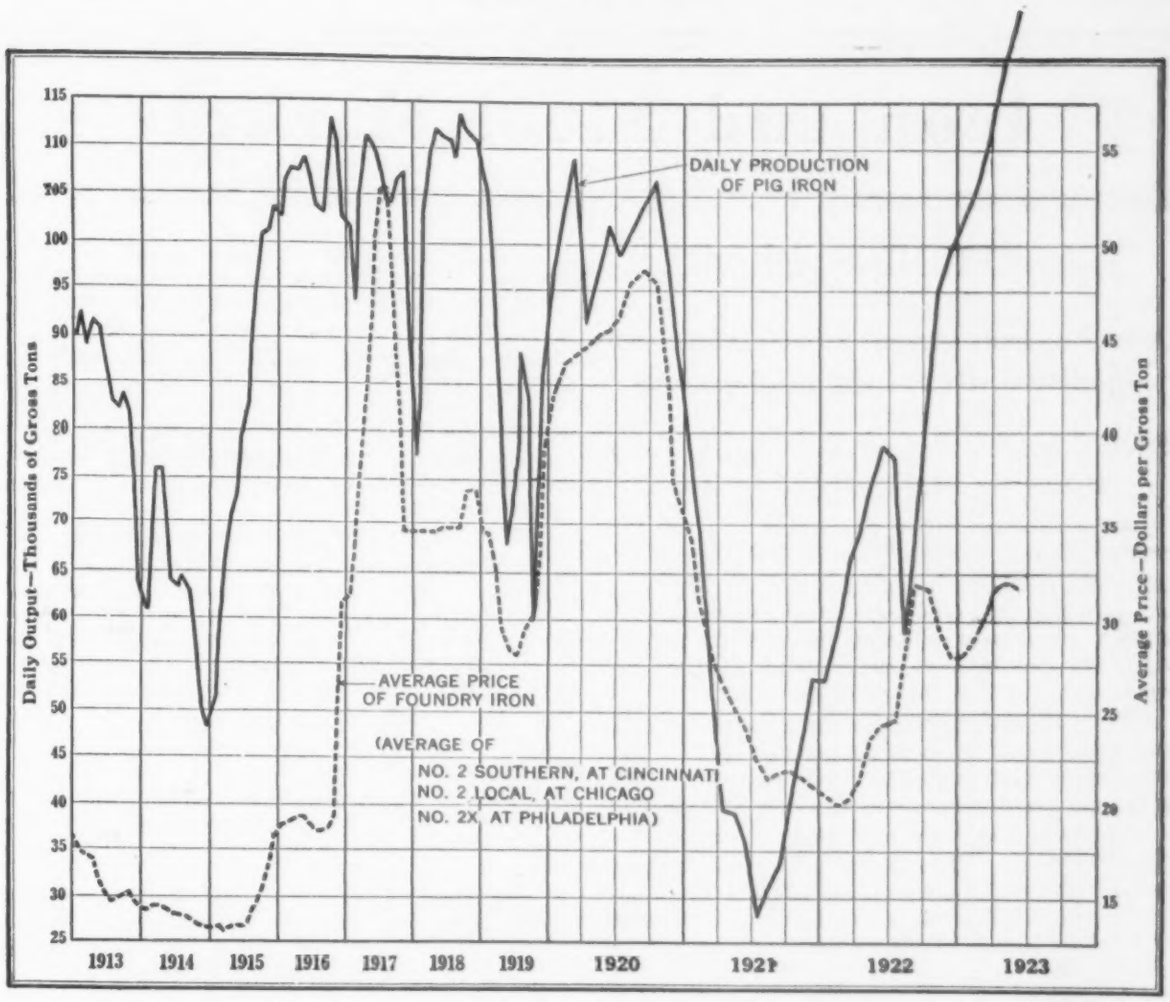


Diagram of Pig Iron Production and Prices

*Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1917—Gross Tons*

| | 1917 | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 |
|---|---|---|---|---|---|---|---|
| Jan. | 101,643 | 77,799 | 106,525 | 97,264 | 77,945 | 53,063 | 104,181 |
| Feb. | 94,473 | 82,835 | 105,006 | 102,720 | 69,187 | 58,214 | 106,935 |
| Mar. | 104,882 | 103,648 | 99,685 | 108,900 | 51,468 | 65,675 | 113,673 |
| Apr. | 111,165 | 109,607 | 82,607 | 91,327 | 39,768 | 69,070 | 118,324 |
| May | 110,238 | 111,175 | 68,002 | 96,312 | 39,394 | 74,409 | 124,764 |
| June | 109,002 | 110,793 | 70,495 | 101,451 | 35,494 | 78,701 | ..... |
| July | 107,820 | 110,354 | 78,340 | 98,931 | 27,889 | 77,592 | ..... |
| Aug. | 104,772 | 109,341 | 88,496 | 101,529 | 30,780 | 58,586 | ..... |
| Sept. | 104,465 | 113,942 | 82,932 | 104,310 | 32,850 | 67,791 | ..... |
| Oct. | 106,550 | 112,482 | 60,115 | 106,212 | 40,215 | 85,092 | ..... |
| Nov. | 106,859 | 111,802 | 79,745 | 97,830 | 47,183 | 94,990 | ..... |
| Dec. | 92,997 | 110,762 | 84,944 | 87,222 | 53,196 | 99,577 | ..... |
| Year | 104,619 | 105,496 | 83,789 | 99,492 | 45,325 | 73,645 | ..... |

### Diagram of Pig Iron Production and Prices

The fluctuations in pig iron production for 1913 to the present time are shown in the accompanying chart. The figures represented by the heavy lines are those of the daily average production by months of coke and anthracite iron. The dotted curve on the chart represents monthly average prices of Southern No. 2 foundry pig iron at Cincinnati, local No. 2 foundry iron at furnaces in Chicago, and No. 2X at Philadelphia. They are based on the weekly quotations of THE IRON AGE.

*Production of Coke and Anthracite Pig Iron in the United States by Months, Beginning Jan. 1, 1919—Gross Tons*

| | 1919 | 1920 | 1921 | 1922 | 1923 |
|---|---|---|---|---|---|
| Jan. | 3,302,260 | 3,015,181 | 2,416,292 | 1,644,951 | 3,229,604 |
| Feb. | 2,940,168 | 2,978,879 | 1,937,257 | 1,629,991 | 2,994,187 |
| Mar. | 3,090,243 | 3,375,907 | 1,595,522 | 2,035,920 | 3,523,868 |
| Apr. | 2,478,218 | 2,739,797 | 1,193,041 | 2,072,114 | 3,549,736 |
| May | 2,108,056 | 2,985,682 | 1,221,221 | 2,306,679 | 3,867,694 |
| June | 2,114,863 | 3,043,540 | 1,064,833 | 2,361,028 | ..... |
| ½ year | 16,033,808 | 18,138,986 | 9,428,166 | 12,050,683 | ..... |
| July | 2,428,541 | 3,067,043 | 864,555 | 2,405,365 | ..... |
| Aug. | 2,743,388 | 3,147,402 | 954,193 | 1,816,170 | ..... |
| Sept. | 2,487,965 | 3,129,323 | 985,529 | 2,033,720 | ..... |
| Oct. | 1,863,558 | 3,292,597 | 1,246,676 | 2,637,844 | ..... |
| Nov. | 2,392,350 | 2,934,908 | 1,415,481 | 2,849,703 | ..... |
| Dec. | 2,633,268 | 2,703,855 | 1,469,086 | 3,086,898 | ..... |
| Year* | 30,582,878 | 36,414,114 | 16,543,686 | 26,880,383 | ..... |

*These totals do not include charcoal pig iron. The 1922 production of this iron was 224,731 tons.

## Capacities of Youngstown Companies

Commenting on acquisition of the properties of the Brier Hill Steel Co., officials of the Youngstown Sheet & Tube Co., at Youngstown, state it is already apparent that the combination contains great possibilities in the way of economy and efficiency. All the former Brier Hill plants are now being operated as part of the Sheet & Tube company. Needed additions and improvements will be made as rapidly as possible, so as to round out these properties and permit of their economical and profitable operation. However, until construction costs are lower, this work will be held in abeyance.

The following approximate annual production capacities of the new organization are:

| | | |
|---|---|---|
| By-product coke | 1,870,000 | tons |
| Benzol | 5,470,000 | gal. |
| Pig iron | 1,731,000 | tons |
| Steel ingots | 2,100,000 | tons |
| Blooms, slabs, etc. | 1,760,000 | tons |
| Pipe | 565,000 | tons |
| Plates | 240,000 | tons |
| Sheets | 270,000 | tons |
| Merchant bars | 225,000 | tons |
| Wire rods | 140,000 | tons |
| Plain wire | 120,000 | tons |
| Wire nails | 1,000,000 | kegs |
| Barbed wire | 20,000 | tons |
| Wire fencing | 20,000 | tons |
| Wire hoops | 3,000 | tons |
| "Buckeye" conduit | 30,000 | tons |
| "Realflex" armored cable | 40,000,000 | ft. |

# Iron and Steel Markets

## ALL RECORDS BROKEN

### May Pig Iron Output Remarkable—Annual Rate Over 45¾ Million Tons

### Steel Shipments Largest Ever Made—Easier Market for Some Finished Products

With no pronounced development in the steel market, interest centers in the remarkable performance of the country's blast furnaces in May. Another high record was made, with an output of 3,867,694 gross tons, or 124,764 tons a day, as against 3,549,736 tons in April, which established the previous record of 118,324 tons a day.

The gain last month was almost entirely in the pig iron output of steel companies. Of the total increase of 6440 tons a day, they contributed 5884 tons, and the merchant furnaces only 556 tons.

Fourteen blast furnaces went in in May and three blew out. The capacity of the 321 furnaces active on June 1 is estimated at 125,100 tons a day, as against 119,500 tons a day for the 310 furnaces in blast on May 1. Thus, as the month opened, the country was producing pig iron at an annual rate far beyond precedent—something more than 45¾ million tons (including the relatively small amount of charcoal iron). This is nearly 16 per cent above the record of 39,434,000 tons in 1916.

Full statistics for steel are not yet in, but it is known that the May output was as remarkable as that of pig iron. A number of steel companies outdid their best previous performance, not only in steel ingots, but in various forms of finished material. The great Gary plant, in making the largest mill shipments in its history, had not a little company.

Here and there producers report an increase in sales as compared with the second half of May, but orders on the books are so large that a new buying movement is not expected pending a better appraisal of consumption as compared with the present surprising production.

The unusual heat of the past week brings up the possibility of some reduction in mill rollings, but this is not a factor as yet.

The more common price on steel bars is now 2.40c., and bar deliveries are better, in common with those for plates and shapes.

There are lower quotations on fabricated steel than were to be had in April before the halt in building.

At Chicago and in the Central West bar iron, rail steel reinforcing bars, and blue annealed and black sheets show some concessions. While 3.85c. is the Steel Corporation contract price for black sheets, some mills have shipped from excess stocks at 3.70c.

An easier situation has developed in nuts and bolts.

Can companies are not getting full deliveries on their tin plate contracts. Evidently 1923 will set a new record in production and consumption of tin plate.

The New York Central has not made its awards, but the expected distribution of its 150,000 tons of rails is 84,000 tons to Bethlehem, 56,000 tons to the Steel Corporation and 10,000 tons to Inland. The Pennsylvania Railroad buying may reach 50,000 to 60,000 tons, but actual orders are still withheld.

Including 2000 for the Seaboard Air Line, 2475 cars have just been bought; the American Locomotive Co. reports sales of 48 locomotives, 44 to the Canadian National Railways, and inquiries have appeared for 30 electric locomotives, 50 motor coaches and a fair volume of car repair work.

Of 12,500 tons of fabricated steel awards, over half was for New York subway work. Not counting the 40,000 tons and more expected to go into Philadelphia subways, there are fresh inquiries for nearly 17,000 tons, two-thirds of which is for public and public service undertakings with relatively little for private enterprises or for railroads.

The trend of pig iron prices is downward in nearly all centers. Eastern Pennsylvania furnaces which had long resisted buyers' efforts to obtain concessions have reduced their quotations on basic and foundry grades $2 per ton. Sales of 20,000 tons of basic have been made at Philadelphia at the reduced price, but little foundry iron business has developed there. In the immediate Chicago district, furnaces continue recent quotations, but sellers at distant points report having lost business, especially in malleable, to Chicago competitors. Transactions in Southern iron are limited and are mostly resales.

The contract coke market has eased off further and some blast furnace companies have been able to buy ahead at $5.50 at oven as against $5.75 last week and at $6 earlier in May.

## Pittsburgh

### Specifying Still Satisfactory — Production Heavy Despite Hot Weather

PITTSBURGH, June 5.—The market is drifting at anchor. Strictly new business still is on a small scale, but at the same time there is no evidence of any inclination on the part of consumers to withhold specifications against tonnages already ordered and so long as market quotations are above those on business already entered, there is not much danger that buyers will hold up shipments. Unfilled orders are decreasing pretty steadily as a result of the fact that shipments still considerably exceed new business, but with the hot weather and its effect upon working organizations it is probable that succeeding weeks will see some change of this tendency. Indeed not a few of the trade are encouraged by the belief that the loss of production through loss of labor incident to summer temperature will offset in a large measure the decrease in new business. It is also believed that the great bulk of present mill engagements represent legitimate re-

# A Comparison of Prices

**Advances Over the Previous Week in Heavy Type, Declines in Italics**

At date, one week, one month, and one year previous

## For Early Delivery

| Pig Iron, Per Gross Ton: | June 5, 1923 | May 29, 1923 | May 8, 1923 | June 6, 1922 |
|---|---|---|---|---|
| No. 2X, Philadelphia‡ | *$30.76* | $32.76 | $32.76 | $26.26 |
| No. 2, Valley furnace† | 29.00 | 29.00 | 31.00 | 24.00 |
| No. 2, Southern, Cin'ti† | 29.55 | 29.55 | 31.05 | 23.00 |
| No. 2, Birmingham, Ala.† | 25.50 | 25.50 | 27.00 | 18.50 |
| No. 2 foundry, Chicago* | 32.00 | 32.00 | 32.00 | 23.00 |
| Basic, del'd, eastern Pa. | *28.14* | 30.00 | 30.25 | 25.00 |
| Basic, Valley furnace | 27.50 | 27.50 | 31.00 | 25.00 |
| Valley Bessemer, del Pitts. | 30.77 | 30.77 | 32.77 | 26.96 |
| Malleable, Chicago* | 32.00 | 32.00 | 32.00 | 23.00 |
| Malleable, Valley | 29.00 | 29.00 | 31.00 | 24.50 |
| Gray forge, Pittsburgh | 30.27 | 30.27 | 32.27 | 25.46 |
| L. S. charcoal, Chicago | 36.65 | 36.65 | 36.65 | 29.00 |
| Ferromanganese, furnace | 130.00 | 130.00 | 130.00 | 67.50 |
| **Rails, Billets, Etc.,** Per Gross Ton: | | | | |
| O.-h. rails, heavy, at mill | $43.00 | $43.00 | $43.00 | $40.00 |
| Bess. billets, Pittsburgh | 43.00 | 43.00 | 45.00 | 35.00 |
| O.-h. billets, Pittsburgh | 45.00 | 45.00 | 45.00 | 35.00 |
| O.-h. sheet bars, P'gh | 45.00 | 45.00 | 45.00 | 35.00 |
| Forging billets, base, P'gh. | 55.00 | 55.00 | 55.00 | 40.00 |
| O.-h. billets, Phila | 50.17 | 50.17 | 50.17 | 40.74 |
| Wire rods, Pittsburgh | 51.00 | 51.00 | 51.00 | 38.00 |
| | Cents | Cents | Cents | Cents |
| Skelp, gr. steel, P'gh, lb. | 2.45 | 2.45 | 2.50 | 1.70 |
| Light rails at mill | 2.25 | 2.25 | 2.25 | 1.50 |
| **Finished Iron and Steel,** | | | | |
| *Per Lb. to Large Buyers:* | Cents | Cents | Cents | Cents |
| Iron bars, Philadelphia | 2.72 | 2.72 | 2.825 | 1.96 |
| Iron bars, Chicago | 2.60 | 2.60 | 2.60 | 1.70 |
| Steel bars, Pittsburgh | 2.40 | 2.40 | 2.40 | 1.70 |
| Steel bars, Chicago | *2.60* | 2.74 | 2.69 | 1.75 |
| Steel bars, New York | 2.74 | 2.74 | 2.74 | 1.98 |
| Tank plates, Pittsburgh | 2.50 | 2.50 | 2.50 | 1.60 |
| Tank plates, Chicago | *2.80* | 2.84 | 2.84 | 1.75 |
| Tank plates, New York | 2.84 | 2.84 | 2.84 | 1.98 |
| Beams, Pittsburgh | 2.50 | 2.50 | 2.50 | 1.60 |
| Beams, Chicago | *2.70* | 2.84 | 2.84 | 1.75 |
| Beams, New York | 2.84 | 2.84 | 2.84 | 1.98 |
| Steel hoops, Pittsburgh | 3.30 | 3.30 | 3.30 | 2.40 |

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

| Sheets, Nails and Wire, | June 5, 1923 | May 29, 1923 | May 8, 1923 | June 6, 1922 |
|---|---|---|---|---|
| *Per Lb. to Large Buyers:* | Cents | Cents | Cents | Cents |
| Sheets, black, No. 28, P'gh. | 3.85 | 3.85 | 3.85 | 3.15 |
| Sheets, galv., No. 28, P'gh | 5.00 | 5.00 | 5.25 | 4.15 |
| Sheets, blue an'l'd, 9 & 10 | 3.00 | 3.00 | 3.25 | 2.40 |
| Wire nails, Pittsburgh | 3.00 | 3.00 | 3.00 | 2.40 |
| Plain wire, Pittsburgh | 2.75 | 2.75 | 2.75 | 2.25 |
| Barbed wire, galv., P'gh | 3.80 | 3.80 | 3.80 | 3.05 |
| Tin plate, 100-lb. box, P'gh. | $5.50 | $5.50 | $6.00 | $4.75 |
| **Old Material,** | | | | |
| Carwheels, Chicago | $22.50 | $22.50 | $26.00 | $18.25 |
| Carwheels, Philadelphia | 23.00 | 23.00 | 25.00 | 17.00 |
| Heavy steel scrap, P'gh | 21.50 | 21.50 | 23.50 | 17.00 |
| Heavy steel scrap, Phila | *18.00* | 19.00 | 20.00 | 15.00 |
| Heavy steel scrap, Ch'go | *18.50* | 19.00 | 20.00 | 14.50 |
| No. 1 cast, Pittsburgh | *25.00* | 25.50 | 27.00 | 18.50 |
| No. 1 cast, Philadelphia | *23.00* | 23.50 | 25.00 | 19.00 |
| No. 1 cast, Ch'go. (net ton) | *22.00* | 22.50 | 24.00 | 16.00 |
| No. 1 RR. wrot., Phila. | 23.00 | 23.00 | 25.00 | 17.00 |
| No. 1 RR. wrot., Ch'go. (net) | *16.00* | 16.50 | 18.50 | 12.50 |
| **Coke, Connellsville,** Per Net Ton at Oven: | | | | |
| Furnace coke, prompt | $4.75 | $4.75 | $5.00 | $6.50 |
| Foundry coke, prompt | 5.75 | 5.75 | 6.00 | 7.00 |
| **Metals,** | | | | |
| *Per Lb. to Large Buyers:* | Cents | Cents | Cents | Cents |
| Lake copper, New York | *15.25* | 15.50 | 16.75 | 14.00 |
| Electrolytic copper, refinery | 14.75 | 14.75 | 16.25 | 13.75 |
| Zinc, St. Louis | 6.40 | 6.40 | 7.07½ | 5.32½ |
| Zinc, New York | 6.75 | 6.75 | 7.42½ | 5.67½ |
| Lead, St. Louis | 7.05 | 7.05 | 7.20 | 5.50 |
| Lead, New York | 7.30 | 7.30 | 7.50 | 5.80 |
| Tin (Straits), New York | *41.87½* | 41.75 | 43.62½ | 32.50 |
| Antimony (Asiatic), N. Y. | 7.00 | 7.00 | 7.62½ | 5.25 |

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

**Composite Price June 5, 1923, Finished Steel, 2.789c. Per Lb.**

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

These products constitute 88 per cent of the United States output of finished steel

| | |
|---|---|
| May 28, 1923, | 2.789c. |
| May 8, 1923, | 2.789c. |
| June 6, 1922, | 2.141c. |
| 10-year pre-war average, | 1.689c. |

**Composite Price June 5, 1923, Pig Iron, $28.46 Per Gross Ton**

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

| | |
|---|---|
| May 28, 1923, | $28.79 |
| May 8, 1923, | 30.79 |
| June 6, 1922, | 23.79 |
| 10-year pre-war average, | 15.72 |

quirements and as the manufacturing consumers and jobbers are thought to be going along with moderate stocks of most finished products, there is not much fear that the price structure will be undermined as it was late in 1920 by the liquidation of stocks by these interests. It is realized, however, that the test of prices is ahead, although it will hardly crystallize until the mills are nearer the end of the orders than is the case today. Buyers are either protected or covered against their requirements on an average of the next three months, but generally at prices well below those now current and the question to be decided is how far they will be willing to cover future wants at today's levels.

Although there has been some depletion in labor ranks as the result of hot weather, there has been no material loss in the production and blast furnace operations in this and nearby districts are at the highest point of the year. The furnace of the McKeefery Iron Co., Leetonia, Ohio, went into blast late last week and the stack of the Sharpsville Furnace Co., Sharpsville, Pa., goes in today or tomorrow. The furnace of the Kittanning Iron & Steel Mfg. Co., Kittanning, Pa., will be blown out late this week. With these changes, 127 of the 138 furnaces in this and nearby districts will be active.

There has been no further change in pig iron prices since a week ago, but demand is exceedingly slack and the market is quite as untested at its present level as it was at the higher figures of a few week ago.

Hardly enough business, except between dealers, is in progress in scrap to establish any change in prices. Blast furnaces in this district have succeeded in forcing a further decline in coke prices, a few contracts having been closed in the past week at $5.50 per net ton at ovens for third quarter as compared with $5.75, last week's minimum. The future of the pig iron market is so uncertain that a good many merchant producers may adopt the plan of buying coke for short periods or even depending upon the spot market for their requirements.

**Pig Iron.**—The only test the past week has provided the market has been an inquiry for 2500 tons of basic iron, this from a merchant furnace interest to cover against a contract. The best price disclosed by this inquiry was $27.50, Valley furnace, and the

business was closed at that figure. Otherwise business has been entirely of single carloads and not a great many of these. Melters still are playing a waiting game and producers hesitate to name prices at less than those recently quoted until there is some evidence that the former really want iron. While Bessemer and No. 2 foundry are quoted at $29 there is little doubt that this price would be shaded 50c. a ton and possibly more on a real inquiry involving a fair sized tonnage. Monthly averages of W. P. Snyder & Co. show a price for May of $28.056, Valley furnace, for basic and $30.10 for Bessemer as compared with $31 for both grades in the previous month. It is evident that there was no business in Valley basic iron in May at $31 to have permitted an average this low for that grade.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.77 per gross ton:

| | |
|---|---|
| Basic | $27.50 |
| Bessemer | 29.00 |
| Gray forge | 28.50 |
| No. 2 foundry | 29.00 |
| No. 3 foundry | 28.50 |
| Malleable | 29.00 |
| Low phosphorus, copper free | 36.00 |

**Ferroalloys.**—The market locally seems to have settled to $125, furnace or seaboard for ferromanganese. While it is possible that for very prompt delivery $130 still might be obtained, there is a complete absence of such demands. Domestic makers now are promising fairly early delivery at that price and imported material can be had at the same figure for delivery after July 1. Buyers appear to be well covered and business in both early and deferred shipments is very limited. The American Manganese Mfg. Co. soon will turn over a furnace now on foundry iron to spiegeleisen and is quoting $50 furnace for 18 to 22 per cent material for single carloads, but is letting it be known that it has a lower quotation on sizable tonnages. Not much business is being done in this territory in this material, most consumers being well covered by contract against their nearby requirements. Deliveries of 50 per cent ferrosilicon on contract are sufficiently free to obviate the necessity of buyers seeking additional supplies and the recent quotation of $95, delivered seems to have pretty well disappeared. It is doubtful whether buyers now have to go above $92.50 on this alloy. Prices are given on page 1671.

**Semifinished Steel.**—While the trend of the market is unmistakably easier, hardly enough business is passing to establish any change from recent quotations. Nonintegrated mills now are getting full shipments on contracts and are largely out of the market. Producers, on the other hand, do not appear to have any surplus tonnages and consequently, the pressure to sell is negligible. Careful investigation discloses no inclination on the part of mills in this and nearby districts to go below $45 on sheet bars, slabs and small billets, but the demand is so limited that the market is very largely untested. It is probable that the appearance of a really sizable inquiry would result in some shading of that price. On forging billets, $55, base, still is the asking price of mills in this territory. Pipe skelp still is quoted at 2.45c, but this price also is untested, since the demand is very light. The market on wire rods slowly is settling to $51, base. We note one sale of 400 tons for fairly early delivery at that price, and also a third quarter contract for 300 tons at that figure. On the other hand, one maker here has taken about 2000 tons for third quarter shipment at $55. On the whole, buyers are cautious about placing third quarter business even at the lower figure, since it does not permit much profit with plain wire at $2.75 per 100 lb. Prices given on page 1671.

**Wire Products.**—Demand for nails and plain wire continues strong, but there is the usual pause in the demand for barbed wire and fence, and some makers who hitherto have been out of the market on the latter products now are in a receptive mood for business. Most makers still have pretty heavy obligations in plain wire and are diverting the steel which has been going to barbed wire and fence to the former in an effort to clear the decks. Labor shortages are hindering production and it is doubtful if any of the mills in this and nearby districts is getting out more than 75 to 80 per cent of capacity production. Prices are given on page 1670.

**Steel Rails.**—Demand for light rails still suffers from the fact that coal mine operations remain very low. Some makers are talking 2.35c base and claim to have made sales at that figure, but sizable tonnages still are readily placed at 2.25c base, and in a broad way that is the top and bottom of the market. Demands for standard rails run chiefly to small lots to piece out.

We quote 25 to 45-lb. sections, rolled from new steel, 2.25c. base; rolled from old rails, 2.15c. to 2.20c. base; standard rails, $43 per gross ton mill for Bessemer and open-hearth sections.

**Sheets.**—The market now is fairly quotable at the Steel Corporation bases of 3.85c for black, 5c for galvanized and 3c for blue annealed. Buying for prompt delivery has disappeared and independent mills now find it impossible to get more than the corporation prices for ordinary deliveries. This development may be partly due to the fact that the leading interest last month made shipments which have been exceeded only a few times in one month in the history of the company. This company is fully booked for the third quarter and barring suspensions will be unable to take on additional business for delivery prior to Oct. 15. A considerable curtailment of production is likely around the first of July, when a number of plants will suspend for periods of from one to two weeks for vacations and plant repairs, and one independent manufacturer is said to be planning to shut down the entire month of July. Prices are given on page 1670.

**Tubular Goods.**—Strictly new business in all products under this heading is very light, but pressure for shipments against orders already in with the mills shows no abatement. May was a very good month in the matter of shipments with the National Tube Co., but those of some of the independent manufacturers were restricted by labor shortages, more especially in their finishing departments. There are still a number of inquiries for small tonnages for early delivery, but in a general way new buying shows up poorly when compared with that of the first quarter of the year. There is an inquiry for 100 miles of 8- or 10-in. plain end pipe for California. Discounts are given on page 1670.

**Tin Plate.**—Activity is lacking for the reason that consumers are pretty well covered against their requirements through the third quarter, and by the same token the mills are filled up for that period. The fear is expressed in manufacturing quarters that with the defection of men on account of hot weather, it will be impossible for the mills to meet their obligations and that there will be something of a pinch in the supply late in the summer. There is no longer much talk of a price of more than $5.50 per base box, Pittsburgh, although more probably would be charged to other than those regarded as regular customers of individual mills.

**Cold-Finished Steel Bars and Shafting.**—Specifications are somewhat more numerous than they have been and there is a fair sprinkling of new orders, but the market is not really active. Deviations from the regular market price of 3.25c base Pittsburgh by manufacturers are unknown, but there are occasional sales by jobbers at below the market, these interests having stocks bought at prices sufficiently low to still show a profit at less than 3.25c. Ground shafting holds at 3.65c base f.o.b. mill for carload lots.

**Hot Rolled Flats.**—New business still is light, but buyers are taking practically all the tonnage due them on old orders and the only change in the general situation is that the mills steadily are reducing their obligations, and in time are likely to be seeking new orders. On the ordinary gages and widths the market is quotable at 3.30c. base, Pittsburgh. Specifications against cotton tie contracts are reported to be coming in well, although the actual size of the 1923 crop still

is indefinite. On the basis of the acreage planted, a crop anywhere from 10,000,000 to 13,000,000 bales is possible. The carrying charge of 1c. per bundle per month on cotton ties goes on July 1. Prices are given on page 1670.

**Cold-Rolled Strips.**—Makers are well supplied with orders for the next three months and report that buyers are specifying very well. Demand for tonnages for prompt delivery no longer amount to much. No shading of the regular market price of 5.25c. base is observed.

**Iron and Steel Bars.**—Specifications against old orders constitute a very much larger percentage of current business than new orders. There is no disposition on the part of mills here to go below 2.40c. base Pittsburgh on steel bars, but there is some uncertainty as to the price that will be charged large users on third quarter shipments. It is hardly a buyers' market, however, with most mills still well committed and not eager for additional tonnage. There has been no change in iron bar prices.

We quote soft steel bars, rolled from billets, at 2.40c., base; bars for cold-finishing of screw stock analysis, $3 per ton over base; reinforcing bars, rolled from billets, 2.40c., base; refined iron bars, 3.25c. base, in carload lots or more f.o.b. Pittsburgh.

**Structural Material.**—The situation shows no change aside from the fact mills are promising somewhat earlier deliveries than they could have done a few weeks ago. We note no deviations from the regular market base of 2.50c., Pittsburgh. Structural shops in this district are still well employed, but new business is not keeping pace with completed jobs. Plain material prices are given on page 1670.

**Plates.**—The rumor is common enough that some mills would go below 2.50c. base Pittsburgh on desirable orders, but verification is lacking. Current demands are few and generally small, important users being well covered and getting ample supplies on contract shipments. Prices are given on page 1670.

**Cast Iron Pipe.**—The United States Cast Iron Pipe & Foundry Co. is low bidder on about 1400 tons of 12-, 16-, 20- and 24-in. pipe for a line connecting the Borough of Homestead, Pa., with the Pittsburgh municipal water works.

**Bolts, Nuts and Rivets.**—It is now probable that second quarter bolt and nut prices will be continued for the third quarter. The Bethlehem Steel Co. is said to have taken this step and leading makers here will probably do likewise. Published quotations still are somewhat above what is actually being done, particularly on attractive business. Specifications are in fair volume. Rivets no longer command more than $3.25 base per 100 lb. for large structural rivets, and on sizable lots some makers are shading that price. Prices and discounts are given on page 1670.

**Track Fastenings.**—Makers are well supplied with orders for standard and boat and barge spikes, but are beginning to catch up on their obligations for small railroad spikes due to the lack of demand from coal mine operators, who are not operating much more than 40 per cent capacity. Makers also have good order books in tie plates. Prices are given on page 1670.

**Coke and Coal.**—Contract furnace coke prices have eased off further since a week ago, business of this sort recently closed having been at $5.50 per net ton at ovens, a drop of 25c. a ton as compared with last week. Some oven operators still are asking $6 on third quarter tonnages, but this price lately has become impossible. The spot market remains easy, with standard fuel readily obtainable at $5 per net ton ovens and good coke to be had at $4.75. Spot foundry coke is quotable all the way from $5.50 to $6.50, with $5.75 to $6 the basis on the bulk of the business. One producer has come out with a price of $7.50 for last half contracts, but the response by consumers has been slow because this price is so far out of line with the spot market and the coke market in general. There is a gradual increase in the inquiry for coal, but no decided strengthening in prices. We still regard the prompt market on mine run steam coal as $1.75 to $2.25 per net ton at mines and gas and coking coal as $2.50 to $2.75.

**Old Material.**—Trading is still very quiet in this market; indeed hardly enough is being done to establish any particular change in prices. If there is a definite tendency one way or another, it is toward firmness, this being especially apparent in the better grades of melting steel. Good railroad or industrial heavy melting steel, the mills admit, cannot be bought at less than $23, and it is said that some of those who participated in the recent large sales to the Jones & Laughlin Steel Corporation are having some trouble in obtaining material that is acceptable. Compressed sheets are practically as valuable as the heavy melting steel now being shipped. The market shows some weakness on heavy breakable cast, due to the fact that a nearby steel mill cancelled all uncompleted contracts and this has resulted in a good many cars being thrown on the market. The Baltimore & Ohio Railroad will receive bids until noon June 11 for 22 cars and 16,130 gross tons of old material. The list includes 2500 gross tons of miscellaneous rails and 4000 tons of destroyed steel cars. The Pennsylvania Railroad June list contains 26,000 gross tons on the Eastern Region alone.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

| | *Per Gross Ton* | |
|---|---|---|
| Heavy melting steel | $21.50 to | $22.00 |
| No. 1 cast, cupola size | 25.00 to | 25.50 |
| Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa | 22.00 to | 22.50 |
| Compressed sheet steel | 21.00 to | 21.50 |
| Bundled sheet sides and ends | 19.50 to | 20.00 |
| Railroad knuckles and couplers | 25.00 to | 25.50 |
| Railroad coil and leaf springs | 25.00 to | 25.50 |
| Low phosphorus standard bloom and billet ends | 27.00 to | 27.50 |
| Low phosphorus, plates and other grades | 25.50 to | 26.00 |
| Railroad malleable | 24.00 to | 24.50 |
| Steel car axles | 25.50 to | 26.00 |
| Cast iron wheels | 23.00 to | 23.50 |
| Rolled steel wheels | 25.00 to | 25.50 |
| Machine shop turnings | 18.50 to | 19.00 |
| Heavy steel axle turnings | 20.00 to | 20.50 |
| Short shoveling turnings | 18.50 to | 19.00 |
| Cast iron borings | 19.00 to | 19.50 |
| Heavy breakable cast | 20.50 to | 21.50 |
| Stove plate | 17.50 to | 18.00 |
| Sheet bar crop ends | 25.50 to | 26.00 |
| No. 1 railroad wrought | 18.00 to | 18.50 |

## American Files Declared Better Than the Sheffield Product

WASHINGTON, June 4.—The quality of steel in the American file is better than that in the Sheffield, England, product, according to information given Consul William J. Grace, Sheffield, from whom the Department of Commerce has just received a review of the iron and steel industry in the Sheffield consular district for the quarter ended March 31. He declares that the superiority of steel in the American file is known in the Sheffield district for the reason that a higher grade of steel is shipped from there to the United States, made into files, which come back to Sheffield to be sold at even lower prices than those manufactured in that district. It is stated that the files from two American manufacturers are popular, the quality excellent and the price lower than the domestic product.

The comment made on the relative qualities of American and Sheffield tool steel is accepted as being particularly timely at this period when industries in both countries engaged in this line of manufacture are said to be sharply competing with each other in foreign markets. Added interest is provided by reason of the fact that the Tariff Commission is conducting an investigation based on an application seeking an increase of 50 per cent in the duty on Swiss files, and it will be recalled that makers of tool steel in the Sheffield district appeared before the Senate Committee on Finance during hearings on the Fordney-McCumber tariff bill and protested against duties proposed on tool steel and its raw materials.

# Chicago

## Weakness Develops in Some Finished Lines—Strong Pressure for Deliveries

CHICAGO, June 5.—While buying continues at a low rate, there is an almost total absence of cancellations or suspensions and pressure for deliveries is unremitting. At the same time shipments from local mills are very heavy, the tonnage shipped in May from the Gary plant having been the greatest for any month in its history. Chicago producers are still well booked ahead, although some mills are more heavily committed than others, but considering the small size of most current inquiries for finished steel, buyers find it less difficult to place their early needs here. Small quantities of soft steel bars, shapes and plates for specific shipment have been ordered at 2.60c., 2.70c. and 2.80c., Chicago, respectively. If demand should grow active again it is probable that local sources of supply would prove inadequate and that buyers would be forced to revert to the practice of buying considerable steel from mills east of here.

Bar iron, rail steel bars and blue annealed sheets show some evidences of weakness, although prices are still fairly steady and concessions are of a sporadic nature. Bolts and nuts are also softer, but wire products and cast-iron pipe are firm.

**Ferroalloys.**—Outside of inquiries for 50 tons of ferromanganese and a carload of 12 to 14 per cent ferrosilicon for prompt shipment, there is little activity in the ferroalloys. Prices are unchanged and it is intimated that ferromanganese may again be advanced. Producers are shipping heavily against contracts for 50 per cent ferrosilicon, but there is no new interest in this alloy.

We quote 80 per cent ferromanganese, $132.56 for second half delivery and $137.56 for prompt shipment; 50 per cent ferrosilicon, $95, delivered; spiegeleisen, 18 to 22 per cent, $53.58 to $56.08, delivered.

**Pig Iron.**—Buyers still delay their third quarter buying, but a gradual increase in prompt orders is regarded as indication that their stocks are running low. The situation appears to have resolved itself into an endurance contest between melters and sellers. Much of the confidence of producers lies in the evidences of unabated consumption. There have been practically no suspensions and in most cases melters are pressing for shipments. One large user has asked that all of the tonnage which he had ordered for third quarter be shipped in June. Local iron remains unchanged at $32 base, furnace, although this price has been shaded in territory intermediate between Chicago and other producing centers where the competition of outside furnaces had to be met. It is also to be noted that the silicon differential for each 50 points in silicon which was formerly $1 a ton is now 50c. Alabama furnaces are generally on a $27, Birmingham, base. Resale iron, however, is still available at $26, base, Birmingham. Among current inquiries are 750 tons of foundry wanted by a northern Indiana industry for third quarter and 300 tons of foundry desired by an Indiana railroad shop for prompt shipment. A southern Michigan melter who was in the market for 1000 tons of malleable is understood to have closed for 500 tons for early delivery on the basis of $28, Ironton. A user in the Upper Peninsula of Michigan who has been inquiring for 500 tons of foundry for delivery over the next four months has closed for part of that quantity. A Wisconsin melter has bought 500 tons of charcoal at the regular market for delivery over the next 90 days. Another Wisconsin plant is inquiring for 250 tons of 10 per cent silvery for prompt shipment and a Milwaukee melter wants 200 tons of low phosphorus for delivery in 60 days. The Thomas Furnace at Milwaukee, which operated for a time on low phosphorus, is again producing malleable. The freight on pig iron from Chicago to Milwaukee and intermediate points was raised from 76c. a ton to $1, effective June 1. The Wells, Mich., charcoal furnace has resumed operations after a period of idleness.

Quotations on Northern foundry high phosphorus malleable and basic irons are f.o.b. local furnace and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards or, when so indicated, f.o.b. furnace other than local:

| | |
|---|---|
| Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago | $36.65 |
| Northern coke, No. 1, sil. 2.25 to 2.75 | 33.00 |
| Northern coke, foundry No. 2, sil. 1.75 to 2.25 | 32.00 |
| Malleable, not over 2.25 sil. | 32.00 |
| Basic | 32.00 |
| High phosphorus | 32.00 |
| Southern No. 2 | $32.01 to 33.01 |
| Low phos., sil. 1 to 2 per cent, copper free (nominal) | $37.00 to 38.00 |
| Silvery, sil. 8 per cent | 44.29 |

**Rails and Track Supplies.**—The New York Central has ordered 150,000 tons of rails of which 10,000 tons was placed with the Inland Steel Co. and 56,000 tons with Steel Corporation mills, most of it for rolling by the Illinois Steel Co. The Pennsylvania has placed 15,000 tons with an Eastern mill. New business in track supplies is largely in small lots, and the attention of the railroads is focused rather on getting what they now have on mill books. Local mills now have enough track supply bookings to keep them busy until well toward the end of the year.

Standard Bessemer and open-hearth rails, $43; light rails, rolled steel, 2.25c., f.o.b. makers' mills.

Standard railroad spikes, 3.25c. mill; track bolts with square nuts, 4.25c. mill; iron tie plates, 2.85c. mill; steel tie plates, 2.60c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.80c. base and track bolts, 4.80c. base.

**Plates.**—New business falls considerably short of current shipments, but there are practically no cancellations or suspensions and pressure for deliveries is undiminished. Importunities for shipments are particularly insistent from tank fabricators and carbuilders and in some instances the latter have gone into the open market for material rather than wait for deliveries from their usual sources of supply. Less difficulty is expected on this score, however, as local mills have been shipping very heavily for the past month. Railroad freight cars ordered in the first five months of this year total 82,547 and passenger cars 2477. A current inquiry from the Kansas City Southern requires 5000 tons of plates, shapes and bars. Plates for indefinite delivery remain unchanged at 2.60c., Chicago. Few orders for early delivery are being placed and those that are generally involve small quantities which can be obtained from local sources at 2.80c., Chicago. Large tonnages for specific shipment would probably have to be bought from mills east of here.

The mill quotation is 2.60c. to 2.80c., Chicago. Jobbers quote 3.30c. for plates out of stock.

**Structural Material.**—Fabricating awards continue light, although there remains considerable business which is unclosed. It would appear, however, that building activity is definitely on the wane. Fabricators are well fortified for a dull period, having from three to six months' work ahead of them. Nevertheless a few shops are still in a position to offer relatively early deliveries. Plain material remains unchanged at 2.60c., Chicago, for indefinite delivery, and demand for steel for specific shipment is confined largely to small lots, which, in most instances, can be procured from local producers at 2.70c., Chicago.

The mill quotation on plain material is 2.60c. to 2.70c. Chicago. Jobbers quote 3.30c. for plain material out of warehouse.

**Bars.**—Buying of soft steel bars is limited, although shipment against old orders are heavy and few indications of reduced consumption have appeared. Notwithstanding persistent reports of a slowing down of the automobile industry, the Ford Motor Co. continues to break production records. In the week ending May 15, it manufactured 39,302 cars, exceeding its previous high record by 250. In the same week it built 2940 tractors and 185 Lincoln cars. On May 9, the company established a new daily record of 6616 Ford machines. Other companies are also running at top speed, the Studebaker schedule for 1923 calling for 150,000 cars. Even the Ford company is not so

sanguine as to expect an indefinite continuance of the present high rate of production and a seasonal let-up, if it comes, will not be unexpected. Farm implement makers are again sounding the market for bars with the probability that they will close for part or all of their requirements for their fall programs within the current month. Reinforcing bar dealers are still an important factor in the market and are pressing the mills hard for deliveries to apply against their heavy commitments. New orders offered the mills, however, generally cover relatively small tonnages which can usually be placed with local producers at from 2.50c. to 2.60c., Chicago. Orders and specifications for bar iron do not fall far short of shipments and prices remain fairly steady at 2.60c., Chicago, although concessions of $1 and $2 a ton on attractive tonnages are reported. The general quotation on rail steel bars remains 2.30c., mill, and most producers have from four to six weeks' work ahead. Some business has been taken recently, however.

Mill prices are: Mild steel bars, 2.50c. to 2.60c., Chicago; common bar iron, 2.60c., Chicago; rail steel, 2.25c. to 2.30c., Chicago mill.

Jobbers quote 3.20c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 4.50c. for rounds and 5.05c. for flats, squares and hexagons.

Jobbers quote hard and medium deformed steel bars at 3.15c. base; hoops, 4.55c.; bands, 3.95c.

**Sheets.**—In the absence of active demand, prices are fairly well established on a single level, although a local buyer is reported to have succeeded in placing an order for blue annealed at 2.75c., base Pittsburgh. Black and galvanized are firm. Heat has commenced to interfere with production with the likelihood that it will limit output throughout the summer. The local independent which has been operating at capacity started the week with only 14 out of 18 hot mills running.

Mill quotations are 3.85c. for No. 28 black, 3c. for No. 10 blue annealed and 5c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote, f.o.b. Chicago, 4.35c. for blue annealed, 5.20c. for black and 6.35c. for galvanized.

**Cast Iron Pipe.**—The United States Cast Iron Pipe & Foundry Co. has taken orders for 4700 tons for Flint, Mich., and 1700 tons for Cleveland. Highland Park, Ill., has awarded 280 tons of 6 and 8-in. to a general contractor. North Milwaukee, Wis., takes bids today on 150 tons. Prices are firm.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $64.20; 6-in. to 12-in., $60.20; above 12-in., $58.20 to $59.20; class A and gas pipe, $5 extra.

**Bolts and Nuts.**—Although a fair number of third quarter contracts have been closed at the March 1 discounts, concessions of 10 per cent have been made on attractive business. Demand is light from the jobbers who are well stocked, and there is little buying by the railroads. A seasonable let-up in the automobile industry is making itself felt, although specifications from that source are still rather liberal. Consumption of bolts and nuts by implement makers shows little, if any, reduction. They are expected to place contracts for their fall programs shortly.

Jobbers quote structural rivets, 4c.; boiler rivets, 4.10c.; machine bolts up to ⅝ x 4 in., 45 and 5 per cent off; larger sizes, 45 and 5 off; carriage bolts up to ⅝ x 6 in., 40 and 5 off; larger sizes, 40 and 5 off; hot pressed nuts, squares and hexagons, tapped, $2.50 off; blank nuts, $2.50 off; coach or lag screws, gimlet points, square heads, 50 and 5 per cent off.

**Reinforcing Bars.**—There have been few lettings of concrete bars exceeding 100 tons within the past week, although sales of small lots continue heavy. It is becoming apparent, however, that fewer new buildings are coming onto the market, although there is still a large amount of business pending. Building permits issued in Chicago in May showed a sharp decrease from the total for April. The number of structures was 1273, involving 39,331 ft. of frontage as compared with 1477 buildings fronting 48,190 ft. for April. Warehouse quotations on concrete bars remain steady at 3.15c., Chicago, although a few recent awards involving large tonnages went at concessions.

Pending business includes:

Northern Pacific Railroad, Phalen Creed sewer, St. Paul, Minn., 500 tons.

Hotel, Anderson, Ky., 125 tons.

Sexanes Garage, Chicago, 175 tons.

Stockman's Bank building, Chicago, 100 tons.

Lettings include:

Louis F. Dow Co. Warehouse, St. Paul, Minn., 245 tons to Concrete Steel Co.

Pevely Dairy building, St. Louis, Mo., 100 tons to Concrete Steel Co.

Additions to Detroit city gas plant, Detroit, Mich., 100 tons to McRae Steel Co.

**Wire Products.**—Demand for nails persists despite the lateness of the season, but the situation in barbed wire is easy and purchases of plain wire, although in good volume, show some recession. Mills still find it difficult to reduce their obligations both on account of a shortage of labor and voluntary lay-offs by the men during the hot weather. It is feared that absenteeism during the summer may cut production fully 10 per cent. Dealers are commencing to show interest in woven wire fence now that the fall terms are out, and buying on a liberal scale is expected in due course of time. On the whole, however, the customary summer lull is expected to settle on the market, with a resumption of activity in the fall insured by the absence of stock accumulations among jobbers. For mill prices, see finished iron and steel, f.o.b. Pittsburgh, page 1670.

We quote warehouse prices f.o.b. Chicago: No. 6 to No. 9 bright basic wire, $3.90 per 100 lb.; extra for black annealed wire, 15c. per 100 lb.; common wire nails, $3.95 per 100 lb.; cement coated nails, $3.40 per keg.

**Coke.**—Local by-product foundry coke was reduced 50c. a ton to $14.50, delivered Chicago switching district, effective June 1. Shipments continue heavy, indicating that the melt in this territory is well maintained. Beehive foundry coke is offered here at as low as $5.75, f.o.b. Connellsville, with few takers.

**Old Material.**—The sustaining influence of purchases by short interests disappeared largely with the expiration of May and prices of most grades of scrap have again declined. Consumers continue to buy sparingly, but in most cases are taking all the scrap delivered to them on their contracts. One large steel works, however, has made heavy rejections recently which caused a concerted protest by local dealers. Railroad offerings are heavy and include the Pennsylvania, Northwestern Region, 3400 tons; the St. Paul, 1700 tons; the Wabash, 1500 tons and the Monon, 800 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

| | *Per Gross Ton* | |
|---|---|---|
| Iron rails | $23.50 to | $24.00 |
| Cast iron car wheels | 22.50 to | 23.00 |
| Relaying rails, 56 and 60 lb. | 28.50 to | 29.50 |
| Relaying rails, 65 lb. and heavier | 32.00 to | 35.00 |
| Rolled or forged steel car wheels | 23.50 to | 24.00 |
| Rails for rolling | 20.00 to | 20.50 |
| Steel rails, less than 3 ft. | 21.50 to | 22.00 |
| Heavy melting steel | 18.50 to | 19.00 |
| Frogs, switches and guards cut apart | 18.50 to | 19.00 |
| Shoveling steel | 18.25 to | 18.75 |
| Drop forge flashings | 15.00 to | 15.50 |
| Hydraulic compressed sheets | 17.00 to | 17.50 |
| Axle turnings | 17.00 to | 17.50 |
| *Per Net Ton* | | |
| Iron angle and splice bars | 23.00 to | 23.50 |
| Steel angle bars | 18.50 to | 19.00 |
| Iron arch bars and transoms | 23.00 to | 23.50 |
| Iron car axles | 27.50 to | 28.00 |
| Steel car axles | 21.00 to | 21.50 |
| No. 1 busheling | 15.50 to | 16.00 |
| No. 2 busheling | 11.50 to | 12.00 |
| Cut forge | 16.50 to | 17.00 |
| Pipes and flues | 12.50 to | 13.00 |
| No. 1 railroad wrought | 16.00 to | 16.50 |
| No. 2 railroad wrought | 16.50 to | 17.00 |
| Steel knuckles and couplers | 21.00 to | 21.50 |
| Coil springs | 22.00 to | 22.50 |
| No. 1 machinery cast | 22.00 to | 22.50 |
| No. 1 railroad cast | 20.00 to | 20.50 |
| No. 1 agricultural cast | 20.00 to | 20.50 |
| Low phos. punchings | 18.50 to | 19.00 |
| Locomotive tires, smooth | 19.00 to | 19.50 |
| Machine shop turnings | 12.00 to | 12.50 |
| Cast borings | 13.50 to | 14.00 |
| Short shoveling turnings | 14.00 to | 14.50 |
| Stove plate | 15.50 to | 16.00 |
| Grate bars | 15.50 to | 16.00 |
| Brake shoes | 15.50 to | 16.00 |
| Railroad malleable | 22.00 to | 22.50 |
| Agricultural malleable | 21.50 to | 22.00 |

# New York

## Eastern Pennsylvania Foundry Iron Declines $2—Few Sales Made—Coke Market Weak

NEW YORK, June 5.—The long maintained basis of $31, eastern Pennsylvania, for No. 2 plain pig iron has been abandoned and $29 is now the ruling quotation. Buffalo and Virginia prices are uncertain and untested. The $2 reduction in the price of eastern Pennsylvania iron has brought out only a moderate tonnage. One agency having offices in New York and Boston reports inquiries amounting to about 10,000 tons, but in this immediate territory there is very little activity. The Worthington Pump & Machinery Corporation purchased 500 tons of charcoal and is understood to have shaded the market about $2 per ton. The American Hardware Co. has purchased 800 tons of foundry iron for July-August delivery, the American Car & Foundry Co., 600 tons, and the inquiry of the New York Central for 675 tons is still pending. An inquiry for from 500 to 1000 tons of malleable for June-July delivery has come from a Connecticut melter.

We quote delivered in the New York district as follows, having added to furnace prices $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

| | |
|---|---|
| East. Pa. No. 1 fdy., sil. 2.75 to 3.25 | $33.27 |
| East. Pa. No. 2X fdy., sil. 2.25 to 2.75 | 32.27 |
| East. Pa. No. 2 fdy., sil. 1.75 to 2.25 | 31.27 |
| Buffalo, sil. 1.75 to 2.25 | $33.41 to 33.91 |
| No. 2X Virginia, sil. 2.25 to 2.75 | 34.44 |
| No. 2 Virginia, sil. 1.75 to 2.25 | 33.44 |

**Ferroalloys.**—The ferromanganese market is inactive with demand confined to a moderate amount of contracting for last half at $125, seaboard, with some domestic alloy said to be available for last quarter at $120, furnace. No sales at the latter level have been noted. There have also been sales of a few lots of early delivery alloy at $130, seaboard. Importations of ferromanganese in March were 8082 tons, which is the largest thus far this year, but the average for the first quarter of 6680 tons per month is still considerably below the monthly rate of importation in 1922 or 7780 tons. The spiegeleisen market is also very quiet but firm at unchanged prices. Business in manganese ore is difficult to trace and no activity is reported in Brazilian or Indian ore. Importations in March were 12,799 tons, or the largest thus far this year. The total of 18,264 tons, however, for the first quarter has been exceedingly small. The 50 per cent ferrosilicon and the ferrochromium markets are quiet and featureless at unchanged prices.

**Coke.**—The coke market is weak and prices irregular. For spot delivery foundry coke is available at $5.50 to $6.50 and contracts for high-grade foundry coke are being renewed on a basis of $7.50, although some contracting is being done at $6.50 and $7. Spot tonnages of furnace coke have been sold at $5.50 for standard grades and considerably lower for coke high in sulphur, while contracts for third quarter are usually made at $6 per ton. The price of by-product coke is $12.34 to $12.41, Newark and Jersey City points.

**Finished Iron and Steel.**—Buying of finished steel products is at low ebb, but consumers are unhesitatingly taking the steel which is being shipped to them on contracts and are continuing to specify on such contracts without any indications of diminution in the rate of consumption. On forward buying it is easier to get good deliveries at the minimum prices ruling. For example, bars can be bought at 2.40c., Pittsburgh, for delivery in 30 to 60 days; plates at 2.50c. for 30 to 60 days and shapes at 2.50c. for about the same shipment. While prices $2 to $3 a ton above these minimum quotations are being paid in some instances, such premiums usually apply to less than carload lots or are obtained for promise of shipment within two or three weeks. Small inquiries for plates, shapes and bars are the rule, outstanding exceptions being an inquiry for 4500 tons of plates from the General Petroleum Co., New York, for shipment to the Pacific Coast, and an inquiry for 3000 tons of concrete reinforcing bars for pier work at Charleston, S. C. Notwithstanding the sold-up condition of the tin plate mills it is stated that the Texas Co. was able to place an order for 75,000 boxes of tin plates for August to October requirements. Cold finished steel bars are firm at 3.25c. per lb., Pittsburgh. Bar iron is now freely obtainable at 2.40c., Pittsburgh. Structural steel work and railroad equipment purchases are both in light volume, there being no developments of importance in either field.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.74c. to 2.84c.; plates and structural shapes, 2.84c.; bar iron, 2.74c.

**Warehouse Business.**—A gradual diminishing in demand for most products sold out of stock is beginning to be evident. There is still active business reported in wire and wire products and warehouses handling wrought iron and steel pipe and sellers of spring-steel note only a slight decline in business. No weakness has developed in prices, except for black and galvanized sheets, shading on which has in some instances gone to as low as 4.80c. per lb. and 5.80c. per lb., base, for black and galvanized respectively. A fair estimate of the sheet market is, however, 5c. to 5.25c. per lb., base, for black and 6c. to 6.25c. per lb., base, for galvanized. In the non-ferrous market, old metals are expected to show a distinct upward tendency before long, in sympathy with movement in the London market. We quote prices on page 1688.

**Old Material.**—The market still shows weakness, although there is no change in prices of No. 1 heavy melting steel and railroad quality, $18.50 to $19 per ton being paid delivered to eastern Pennsylvania consumers and $18 per ton delivered to Bethlehem, Pa. A considerable number of lots of rails for rolling are reported among current offerings and a fair estimate of this market is $16 to $18 per ton, buying price, New York, depending upon the shipment to be made. Relaying rails are quotable at $25 to $26 per ton, New York. Specification pipe continues unchanged at $12 to $12.50 per ton, New York, with a small quantity moving to Milton, Pa., at $16 per ton, delivered. Stove plate is not worth to exceed $13.50 to $14 per ton, New York, based on shipments to a consumer in Mahwah and other New Jersey foundries at $16 per ton, delivered. Railroad malleable is fairly firm at $20 to $21 per ton, buying price, New York.

**Cast-Iron Pipe.**—The market on water pipe continues firm and active with makers booked several months ahead. A number of small municipal tenders are being bid upon, among these being one for about 700 tons of water pipe for the City of Mount Vernon, N. Y., bids to open June 27 and one from the City of Woodbury, N. J., for 11,000 ft. of 16-in. pipe, bids to open June 12. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $58.50; 4-in. and 5-in., $63; 3-in., $68.80, with $4 additional for Class A and gas pipe. The soil pipe market is dull, but although shading is reported rather general in many districts, sellers claim that there are so few transactions here at present that lower prices have not been brought out. We quote discounts of both Northern and Southern makers, f.o.b. New York, in carload lots, as follows: 6-in. standard, 13 to 15¾ per cent off list; heavy, 23 to 25¾ per cent off list.

Buying prices per gross ton, New York, follow:

| | |
|---|---|
| Heavy melting steel, yard | $15.00 to $15.50 |
| Steel rails, short lengths, or equivalent | 15.25 to 15.75 |
| Rails for rolling | 16.00 to 18.00 |
| Relaying rails, nominal | 25.00 to 26.00 |
| Steel car axles | 23.00 to 24.00 |
| Iron car axles | 25.00 to 26.00 |
| No. 1 railroad wrought | 17.00 to 18.00 |
| Wrought iron track | 16.00 to 16.50 |
| Forge fire | 14.00 to 14.50 |
| No. 1 yard wrought, long | 15.50 to 16.00 |
| Cast borings (clean) | 13.50 to 14.00 |
| Machine-shop turnings | 13.50 to 14.00 |
| Mixed borings and turnings | 13.00 to 13.50 |
| Iron and steel pipe (1 in. diam., not under 2 ft. long) | 12.00 to 12.50 |
| Stove plate | 13.50 to 14.00 |
| Locomotive grate bars | 13.50 to 14.00 |
| Malleable cast (railroad) | 20.00 to 21.00 |
| Cast-iron car wheels | 22.00 to 23.00 |

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

| | |
|---|---|
| No. 1 machinery cast | $21.00 to $22.00 |
| No. 1 heavy cast (columns, building materials, etc.), cupola size | 20.00 to 21.00 |
| No. 1 heavy cast, not cupola size | 18.00 to 19.00 |
| No. 2 cast (radiators, cast boilers, etc.) | 16.00 to 17.00 |

# Boston

## Pig Iron Market Soft and Number of Sales is Limited

BOSTON, June 5.—Reports of base price and differential shading by Buffalo and central and eastern Pennsylvania furnaces, together with continued offerings of resale and western Pennsylvania give the pig iron market an unsettled appearance on the surface. While lowest prices reported cannot always be substantiated due to a lack of actual transactions, the market is softer. Central Pennsylvania No. IX, third quarter, has been bought at $28.50, furnace, according to one foundry; differentials waived, the base price being $28. Standard eastern Pennsylvania is now being sold on a basis of $29, furnace, a $2 reduction having been made late last week. Northern malleable business was solicited the past week at $33.03, $33.92 and $34.42, delivered in Massachusetts. The New England melt is less than a month ago, and considerable iron bought for second quarter will lap over into third. A quiet month, therefore, is anticipated in the pig iron market.

We quote delivered prices on the basis of the latest reported sales as follows, having added $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia, and $9.60 from Alabama:

| | |
|---|---|
| East. Penn., sil. 2.25 to 2.75 | $34.65 |
| East. Penn., sil. 1.75 to 2.25 | 32.65 |
| Buffalo, sil. 2.25 to 2.75 | 34.41 |
| Buffalo, sil. 1.75 to 2.25 | 33.91 |
| Virginia, sil. 2.25 to 2.75 | 34.92 |
| Virginia, sil. 1.75 to 2.25 | 33.92 |
| Alabama, sil. 2.25 to 2.75 | 37.10 |
| Alabama, sil. 1.75 to 2.25 | 36.60 |

**Iron Importations.**—Total importations of foreign iron for May were 5000 tons of English, none having been unloaded at this port since early in that month. As far as can be ascertained, no further importations are expected this year. In April importations amounted to 11,703 tons, and in March 15,389 tons. January, with its 23,121 tons, was the heaviest month of the year.

**Warehouse Business.**—Warehouse quotations on open-hearth spring steel bars wider than ¾-in. and thicker than 7/32-in. have been reduced $1.50 per 100 lb., and on soft steel and refined iron bars, stock lengths of structural steel, angles and beams and on plates 10c. Prices otherwise remain as heretofore. The movement of iron and steel out of warehouses is less active, and considerable competition is experienced, especially in southern sections of New England, from New York firms.

Jobbers quote: Soft steel bars, $3.51½ per 100 lb.; flats, $4.40; concrete bars, $3.76½ to $3.89; structural angles, channels and beams, $3.61½; tire steel, $4.80 to $5.15; open-hearth spring steel, $6.50 to $10; crucible spring steel, $12; bands, $4.80 to $5.30; hoop steel, $5.80 to $6.30; cold-rolled steel, $4.75 to $5.25; toe calk steel, $6.15; refined iron, $3.51½ per 100 lb.; best refined iron, $4.75; Wayne iron, $5.50; Norway iron, $6.60 to $7.10; steel plates, $3.61½ to $3.86½; No. 10 blue annealed sheets, $4.61½ per 100 lb.; No. 28 black sheets, $5.75; No. 28 galvanized, $6.90.

**Finished Material.**—Users of wire and wire products in this territory are well covered on third quarter requirements. Interest shown by other sections of the country in rails is lacking in New England. Other mill products are in fair demand, but buying generally is not for beyond July requirements. Delivery of materials purchased for second quarter delivery in some instances will extend into third quarter. Round structural steel tonnage requirements continue few and far between, but a material increase in small buying is noted.

**Coke.**—The New England Coal & Coke Co. and the Providence Gas Co. have reduced their price on contract by-product foundry coke from $15 to $14, delivered within the $3.10 freight rate zone. The market for such fuel is the lowest it has been since July, 1922, when the price was advanced from $13.50 to $15.50. Most New England foundries are well covered on fuel, either on a sliding scale cost basis or at price ruling date of shipment. Occasional small sales of Connellsville 72-hr. fuel are being put through, however, at $5.75 to $8, ovens, or $11.30 to $13.55, delivered, mostly at $12.05 to $12.80.

**Old Material.**—Prices have declined further under their own weight rather than because of any pressure to liquidate holdings. They are now down to a basis where dealers in many cases will not sell, which has created the impression the market has reached at least a temporary resting place. Sales the past week were of material that had to be moved and were unimportant. Stove plate values both for nearby and distant delivery show the greatest shrinkage, with yard wrought and chemical borings the next weakest spots in the market. Heavy melting steel is off $1 a ton, continued rejections by mills involving price adjustments of $1 to $5 a ton, influencing the market more than anything else.

The following prices are for gross ton lots delivered consuming points:

| | |
|---|---|
| No. 1 machinery cast | $24.50 to $25.00 |
| No. 2 machinery cast | 22.50 to 23.00 |
| Stove plate | 13.00 to 14.00 |
| Railroad malleable | 26.00 to 26.50 |
| Street car wheels | 23.50 to 24.00 |

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

| | |
|---|---|
| No. 1 heavy melting steel | $14.50 to $15.00 |
| No. 1 railroad wrought | 17.00 to 17.50 |
| No. 1 yard wrought | 15.50 to 16.00 |
| Wrought pipe (1-in. in diam., over 2 ft. long) | 12.00 to 12.50 |
| Machine shop turnings | 12.00 to 13.00 |
| Cast iron borings, rolling mill | 13.00 to 14.00 |
| Cast iron borings, chemical | 14.00 to 14.50 |
| Blast furnace borings and turnings | 12.00 to 13.00 |
| Forged scrap and bundled skeleton | 12.00 to 12.50 |
| Shafting | 19.00 to 20.00 |
| Street car axles | 19.00 to 20.00 |
| Rails for rerolling | 17.00 to 17.50 |

# Birmingham

## Alabama Iron Held at $27 Despite Concessions by Tennessee Furnaces

BIRMINGHAM, ALA., June 5.—So far as direct business with Birmingham pig iron makers is concerned, no sales below $27 base have been made. One small lot of low silicon and high sulphur was sold at $25.50, allowances being made for both off-grade features. Other than this isolated transaction, nothing similar has occurred that could be traced by diligent effort. The feature of the week was a sale of 1000 tons carrying silicon above base, which was booked by a Birmingham maker for nearby Southern consumption at $28, which is $27 base and 50c. for each of the silicon differentials. The purchaser is a large and experienced buyer and the iron is for third quarter. As for Tennessee iron, Birmingham makers express no surprise at occasional dips there, because Tennessee furnaces have a $1.50 lower rate to competitive territory. For like reason Birmingham makers point to Muscle Shoals iron available by lower than all-rail rate through rail and water transportation as coming from a different market. Outside of the 1000-ton lot, business was confined to small lots for prompt shipment. Birmingham melters declare they have not got any iron under the $27 base. So far as selling attitude of makers is concerned, the market has not got below $27. Melters take iron ordered promptly and transportation is excellent. Twenty-eight stacks are now active, with nine on basic, 18 on merchant and one on ferromanganese.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

| | |
|---|---|
| Foundry, silicon 1.75 to 2.25 | $27.00 |
| Basic | 26.00 |
| Charcoal, warm blast | 34.00 |

**Cast Iron Pipe.**—Pressure pipe has had its first comparatively quiet spell. Davidson, N. C., let 900 tons to the United States Cast Iron Pipe & Foundry Co. One maker in better delivery shape than others has been getting as high as $52 for popular pipe sizes on a nominal $49 base. Sanitary pipe is still quiet on a $70 base. Makers holding for $75 have receded from that mark. The largest interests never advanced above $70 they say.

**Coal and Coke.**—Coal production has eased off to 365,000 tons a week, compared with recent 400,000 tons

average following seasonal influences. Coke is firm at $9 to $9.50 for spot.

**Finishing Mills.**—Cuba took 2376 tons of rails last week via Mobile, the cargo divided between four ports. Fusan and Otaru, Japan, took 2483 tons of rails via Mobile. Large tonnage of barbed wire, nails, galvanized and corrugated sheets, steel beams, angle bars, bolts, nuts and spikes were taken by Cuba. Cuba is greatly increasing metal imports. All finishing mills remain at capacity. Wire drawing mills report seasonal decline from the peak demand. Steel bars rule at $2.65, f.o.b. Birmingham.

**Old Material.**—The scrap market looks for easier prices in the immediate future and some materials have been marked down $1 already. Steady shipment of material already ordered will care for yards to July 1, but new business begins to represent a waiting attitude.

We quote per gross ton f.o.b. Birmingham district yards as follows:

| | |
|---|---|
| Old steel rails | $18.00 to $20.00 |
| No. 1 steel | 16.00 to 18.00 |
| No. 1 cast | 23.00 to 24.00 |
| Car wheels | 23.00 to 24.00 |
| Tramcar wheels | 22.00 to 23.00 |
| Stove plate | 17.00 to 18.00 |
| Cast iron borings | 12.00 to 13.00 |
| Machine shop turnings | 12.00 to 13.00 |

# St. Louis

## Pig Iron Melters Refuse to Buy at Present Prices—Some Resale Lots

ST. LOUIS, June 6.—The pig iron market in this district continues to mark time. Melters apparently have decided to do no contracting for the rest of the year until able to obtain price concessions. The furnaces are holding out against lowering their quotations, and it is a question as to which side will be able to last the longest. While no specific reductions have been announced from any producing areas, the trend of prices is easier. Some resale iron has appeared, which can be had under the current levels, and several small transactions in Northern iron direct from furnaces are reported to have been made slightly under $32, Chicago. Stocks in melters' hands are light, and with the melt continuing at its present pace, replenishment cannot be much longer delayed. Actual sales reported include 400 tons to a Davenport, Iowa, melter; 500 tons of malleable to a Peoria interest; 200 tons of foundry iron to a Quincy stove builder and small scattered tonnages totaling about 500 tons. The leading local producer continues to quote $33 to $34, f.o.b. Granite City, but has sold out through the second quarter.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago, $3.28 from Birmingham (rail and water), $5.17 from Birmingham, all rail, and 81 cents average switching charge from Granite City:

| | |
|---|---|
| Northern fdy., sil. 1.75 to 2.25 | $34.16 |
| Northern malleable, sil. 1.75 to 2.25 | 34.16 |
| Basic | 34.16 |
| Southern fdy., sil. 1.75 to 2.25 | 32.17 |

**Finished Iron and Steel.**—Buying by the railroads has revived somewhat during the past two weeks, and ordering of track fastenings, bridge materials and miscellaneous products has been in fair volume. Fabricators report an excellent routine demand, with job work constituting the bulk of their tonnage. No large lettings have been made. As has been the case for several weeks, supplies for the oil fields are active and in good demand, with sellers receiving requests to expedite deliveries. Reinforcing bars are fairly active, and there is a good call for nails and other wire goods, which are in scant supply.

For stock out of warehouse we quote: Soft steel bars, 3.35c. per lb.; iron bars, 3.35c.; structural shapes, 3.45c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 4.45c.; No. 28 black sheets, cold rolled, one pass, 5.20c.; cold drawn rounds, shafting and screw stock, 4.45c.; structural rivets, 4.15c.; boiler rivets, 4.25c.; tank rivets, ⅞ in. and smaller, 50-5 per cent off list; machine bolts, 45-5 per cent; carriage bolts, 40-5 per cent; lag screws, 50-5 per cent; hot pressed nuts, square or hexagon blank, $2.50; and tapped, $2.50 off list.

**Coke.**—Aside from a brisk demand for industrial sizes, the market for coke is quiet. The domestic trade, after a spurt two weeks ago, has lapsed back into quiescence. Storage by householders to date, however, is considerably larger than at the same date last season. Offerings of Connellsville and Wise County coke are somewhat freer, with an easier trend in values. Southern metallurgical coke can be purchased at the moment on terms equalling about 50c a ton cheaper than similar grades of Eastern coke.

**Old Material.**—The market for scrap iron and steel is dead dull, with prices still on the toboggan. Cuts ranging from 50c to $1.50 per ton were made in dealers' lists, but the reductions have failed utterly to stimulate buying. The mills are taking only what they have to, and rejections are more numerous than usual. No new buying is looked for by the industries for from 40 to 60 days. Railroad offerings include the following list: Chicago, Burlington & Quincy, 5500 tons; Pennsylvania Southwestern Region, 6000 tons; Chicago & Alton, 400 tons; Cotton Belt, 22 cars, and a blank list by the Big Four.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

| | |
|---|---|
| *Per Gross Ton* | |
| Iron rails | $20.00 to $20.50 |
| Rails for rolling | 20.00 to 20.50 |
| Steel rails, less than 3 ft. | 20.00 to 20.50 |
| Relaying rails, standard section | 37.50 to 39.00 |
| Cast iron car wheels | 21.00 to 21.50 |
| Heavy melting steel | 17.50 to 18.00 |
| Heavy shoveling steel | 17.00 to 17.50 |
| Frogs, switches and guards cut apart | 18.00 to 18.50 |
| *Per Net Ton* | |
| Heavy axles and tire turnings | 13.25 to 13.50 |
| Steel angle bars | 15.75 to 16.25 |
| Iron car axles | 26.00 to 26.50 |
| Steel car axles | 18.75 to 19.25 |
| Wrought iron bars and transoms | 19.50 to 20.00 |
| No. 1 railroad wrought | 16.50 to 17.00 |
| No. 2 railroad wrought | 16.00 to 16.50 |
| Railroad springs | 21.00 to 21.50 |
| Steel couplers and knuckles | 21.00 to 21.50 |
| Cast iron borings | 13.00 to 13.50 |
| No. 1 busheling | 16.25 to 17.00 |
| No. 1 railroad cast | 19.25 to 19.75 |
| No. 1 machinery cast | 20.00 to 20.50 |
| Railroad malleable | 19.25 to 19.75 |
| Machine shop turnings | 12.00 to 12.50 |

# Buffalo

## Pig Iron Buying Very Light—Easier Conditions in Finished Materials

BUFFALO, June 5.—Buying of pig iron has probably reached its lowest ebb since the inception of the present quiet period; as a background to this fact, however, it is the consensus of opinion with four of the five selling factors that the end of the current listlessness is at hand and that considerable third quarter iron will be sold prior to June 15. Certainly the normal tonnage of iron required for third quarter has not been purchased and must be before the end of the present month unless there follows an unusual curtailment of foundry operations. Only carload lots marked selling activity, and while the greater number of these were at $29.50, base, several were at $29. The largest inquiries were for malleable, one for 200 and another for 300 tons; the price is firm at $30.

We quote f.o.b. per gross ton Buffalo as follows:

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| No. 1 foundry, 2.75 to 3.25 sil. | $30.00 to $30.50 |
| No. 2X foundry, 2.25 to 2.75 sil. | 29.50 to 30.00 |
| No. 2 plain, 1.75 to 2.25 sil. | 29.00 to 29.50 |
| Basic | 28.00 to 29.00 |
| Malleable | 30.00 |
| Lake Superior charcoal | 37.28 |

**Finished Iron and Steel.**—Specifications on existing contracts are slower in coming in, and new business is quieter on all products, with the exception of structural material, pipe and wire. Shipping is easier and the general observation is that all material is going directly into consumption and that stocks are getting low. An encouraging sign is that cancellations have not developed, nor have there been many requests for deferred shipping dates. Bar prices have weakened

in some quarters; quotations of 2.40c have been more frequent, but several sellers are still quoting 2.50c. and getting the business, particularly where prompt shipment enters the transaction. Quotations of 2.45c on shapes have been made by interests hitherto asking 2.50c., but the usual asking price is 2.50c. for shapes and the same for plates. Sheet inquiry is fair, and while the majority of sellers are in agreement with the Steel Corporation price of 3.85c for black, the local maker is asking 4c. This interest has considerable tonnage booked and is not taking commitments freely. It is generally expected that the next price revision will bring black sheet prices to the same basis as the Steel Corporation.

We quote warehouse prices, Buffalo, as follows: Structural shapes, 3.65c.; plates, 3.65c.; soft steel bars, 3.55c.; hoops, 4.65c.; bands, 4.35c.; blue annealed sheets, No. 10 gage, 4.30c.; galvanized steel sheets, No. 28 gage, 6.10c.; black sheets, No. 28 gage, 5.10c.; cold rolled round shafting, 4.45c.

**Old Material.**—Old orders are pretty well cleaned up, and the strength in prices, which came with transactions between dealers trying to fill old contracts, is waning. Steel rejections have been unusually heavy, and mills have turned back considerable material after inspection. Buying is at a standstill, and no transactions of importance have taken place.

We quote, f.o.b. gross ton Buffalo, as follows:

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| Heavy melting steel | $20.50 to 21.50 |
| Low phos., 0.04 and under | 25.00 to 26.00 |
| No. 1 railroad wrought | 19.00 to 20.00 |
| Car wheels | 21.00 to 22.00 |
| Machine shop turnings | 16.00 to 17.00 |
| Cast iron borings | 19.00 to 20.00 |
| No. 1 busheling | 18.00 to 19.00 |
| Stove plate | 18.00 to 19.00 |
| Grate bars | 17.00 to 18.00 |
| Bundled sheet stampings | 15.00 to 16.00 |
| No. 1 machinery cast | 23.00 to 24.00 |
| Hydraulic compressed | 18.50 to 19.50 |
| Railroad malleable | 24.00 to 25.00 |

# Cincinnati

## Shading on Ironton Iron Reported—Buying Movement Expected Soon

CINCINNATI, June 4.—While the market was unusually dull last week, the trade generally feels that a buying movement is just around the corner. Whether this will take the form of covering for third quarter requirements or for month to month needs is difficult to determine, but indications are that buying for short periods will be the policy adopted. Practically all of the orders being placed are for immediate shipment and furnaces are inclined to quote lower prices for prompt shipment than for extended deliveries. An agricultural implement manufacturer bought 750 tons of malleable last week at a price said to figure about $28, Ironton. The order is reported to have gone to a Valley furnace. A Central Ohio melter bought 1000 tons of off grade iron for June shipment, and an Indiana melter took 400 tons of Southern iron for June and July. An inquiry for 1500 tons of malleable from Columbus for third quarter is out, and will likely be bought this week. An Indiana stove manufacturer is also in the market for 500 tons for prompt shipment. Prices generally rule the same as last week, though it is reported that $28, Ironton, can be done on attractive business in the South, the $25.50 price is still available and it is reported that another furnace has quoted and made sales at this figure. There is no activity in basic iron. A few sales of carload lots of silvery have been made at the full schedule, though electric furnaces are now quoting about $2 below the Jackson County schedule. Virginia irons are softer, and while $28 furnace, has been done, on an attractive tonnage, it is said $27 would be considered.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton, we quote f.o.b. Cincinnati:

| | |
|---|---|
| Southern coke, sil. 1.75 to 2.25 (base) | $29.55 to $31.05 |
| Southern coke, sil. 2.25 to 2.75 No. 2 soft) | 30.05 to 31.55 |
| Ohio silvery, 8 per cent | 41.77 |
| Southern Ohio coke, sil. 1.75 to 2.25 (No. 2) | 30.77 to 31.27 |
| Basic Northern | 30.77 |
| Malleable | 30.77 to 31.27 |

**Finished Material.**—The demand for finished materials slackened greatly during the week, and little business was booked. No significance is attached to this condition, however, as it is general in all lines. Little concern is felt as to the future. Sheet mills are practically booked solid for third quarter, and bar, shape and plate makers have orders on hand sufficient to run well into the third quarter. Tin plate is in exceptionally good demand, and most mills are being affected seriously by labor shortage, deliveries by some mills now being quoted at four to five months. No let-up is apparent in metal working plants, and consumers are still anxious for shipments on contracts. Little tonnage has been held up as yet, and stocks are not being accumulated. Prices are firm, bars being quoted generally at 2.40c., with one large independent asking 2.50c. for small tonnages. On plates and shapes, 2.50c. is the ruling quotation, and deliveries can be made by some mills in six to eight weeks. Buying of wire products has been light, but jobbers and dealers are pressing hard for shipments on contracts. Reports of shading of sheet prices are heard, but lack confirmation. One of these was to the effect that a mill had offered a large tonnage of galvanized sheets at 4.90c. The structural market is rather quiet, the only new inquiry being bridge work for the L. & N. Railroad involving 150 tons. On 1200 tons of plate girder work for the Big Four Railroad, the McClintic-Marshall Co. was low bidder on 1000 tons, and the Bethlehem Steel Bridge Corporation low bidder on 200 tons. The municipal stadium at Terre Haute, Ind., 250 tons, has been awarded to the Almira Iron Works, Chicago. Demand for reinforcing bars is being well maintained, although most of the projects run under 100 tons. A private inquiry from Springfield, to be closed June 7, calls for 250 tons of cast iron pipe.

**Warehouse Business.**—Local jobbers report business still active. Reinforcing bars, small shapes and sheets for early delivery are much in demand, with wire products showing improvement. Steel bars are also very active, and cold-rolled steel is moving better. Prices are very firm.

Cincinnati jobbers quote: Iron and steel bars, 3.50c.; reinforcing bars, 3.60c.; hoops, 4.55c.; bands, 4.25c.; shapes, 3.60c.; plates, 3.60c.; cold-rolled rounds, 4.50c.; cold-rolled flats, squares and hexagons, 5c.; No. 10 blue annealed sheets, 4.25c.; No. 28 black sheets, 5.35c.; No. 28 galvanized sheets, 6.35c.; No. 9 annealed wire, $3.60 per 100 lb.; common wire nails, $3.60 per keg base.

**Tool Steel.**—The demand for tool steels shows no let-up. Prices are strong, 18 per cent tungsten high speed steel being quoted at 75c. to 95c. per lb.

**Coke.**—There is little activity in the coke market, and hold-ups have become more numerous. Prices are inclined to go lower, particularly on spot business, but the market as a whole remains at last week's levels.

**Old Material.**—The tendency in the scrap market is still downward, and declines of $1 on practically all items were registered last week. Steel mills in this district are offering $20, delivered, for heavy melting steel, but are not particularly anxious to secure tonnages even at that price. We note a sale of 800 tons of iron axles at $26, delivered. This item is particularly scarce. Cast grades are easier, and more tonnage is coming out.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

*Per Gross Ton*

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|---|---|
| Bundled sheets | $14.50 to $15.00 |
| Iron rails | 17.00 to 17.50 |
| Relaying rails, 50 lb. and up | 29.50 to 30.00 |
| Rails for rolling | 19.00 to 19.50 |
| Heavy melting steel | 18.00 to 18.50 |
| Steel rails for melting | 16.50 to 17.00 |
| Car wheels | 17.50 to 18.00 |

*Per Net Ton*

| | |
|---|---|
| No. 1 railroad wrought | 14.00 to 14.50 |
| Cast borings | 13.00 to 13.50 |
| Steel turnings | 12.00 to 12.50 |
| Railroad cast | 18.50 to 19.00 |
| No. 1 machinery cast | 22.50 to 23.00 |
| Burnt scrap | 14.50 to 15.00 |
| Iron axles | 25.00 to 25.50 |
| Locomotive tires (smooth inside) | 15.00 to 15.50 |
| Pipes and flues | 12.00 to 12.50 |

# Philadelphia

## Reduction of $2 a Ton by Eastern Pennsylvania Furnaces on Pig Iron

PHILADELPHIA, June 5.—A reduction of $2 a ton in prices of all grades of pig iron except low phosphorus by eastern Pennsylvania furnaces and the purchase of 20,000 tons of basic iron by an Eastern steel company were the chief developments in an otherwise quiet week. Steel business is in small volume, but specifications on contracts are being received without reductions, indicating a healthy rate of consumption. The extreme heat of the past several days has caused loss of output at some Eastern plants, particularly in sheet mills, where the work is particularly trying in very hot weather.

**Pig Iron.**—Convinced that consumers would not enter the market for third quarter requirements at the level of prices recently prevailing, an Eastern furnace company, having two stacks in blast, late last week announced a $2 reduction in prices on all of the grades it makes, this being promptly followed by similar reductions by all furnaces in this district. The reduction does not apply to low phosphorus iron, but all other grades are affected. The new quotations are $29 for No. 2 plain, $30 for No. 2 X, $31 for No. 1 X, $28 for gray forge and $30 for malleable, all f.o.b. cars furnace. A new price on basic iron was established by the purchase of 20,000 tons by an Eastern steel company at $28.14, delivered, the same price, it is stated, being paid to all of the seven furnaces which accepted portions of the tonnage. This iron is to be shipped in July, with some deliveries probably extending into August. The reduction in price on foundry iron has brought out only a small response from buyers. Eastern furnaces booked several thousand tons last week, but this business came largely from New England. It cannot be said that there are signs of a third quarter buying movement being under way. Two cast iron pipe companies are in the market for 1000 tons each, a Philadelphia engineering company is inquiring for 600 tons and the Westinghouse plant at Essington has revived its recent inquiry for 1200 tons of foundry and Bessemer grades. Otherwise there is not much inquiry and such as there is consists of small lots. Selling of iron in eastern Pennsylvania by furnaces in the western and central sections of the State at prices below those which the eastern Pennsylvania furnaces were quoting was the factor which led to the decision by nearby furnaces to lower their quotations. These outside furnaces, though ordinarily unable to ship much iron to this section by reason of freight rate disadvantage, were taking most of the small amount that was being placed up to several days ago. Virginia furnaces may make a reduction soon. Virginia iron is available at $27, base, furnace, but all furnaces have not gone to that level. Imports of pig iron from Europe have practically ceased, but 4828 tons came in last week from Nova Scotia.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76 cents to $1.64 per gross ton:

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|---|---|
| East. Pa. No. 2 plain, 1.75 to 2.25 sil. | $29.76 to $30.64 |
| East. Pa. No. 2X, 2.25 to 2.75 sil. | 30.76 to 31.64 |
| East. Pa. No. 1X | 31.76 to 32.64 |
| Virginia No 2 plain, 1.75 to 2.25 sil. | 32.17 to 33.17 |
| Virginia No. 2X, 2.25 to 2.75 sil. | 33.17 to 34.17 |
| Basic delivered eastern Pa. | 28.14 |
| Gray forge | 28.00 to 29.00 |
| Malleable | 31.14 to 31.64 |
| Standard low phos. (f.o.b. furnace) | 31.00 to 35.00 |
| Copper bearing low phos. (f.o.b. furnace) | 33.00 |

*Foreign Pig Iron*

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| All prices f.o.b. cars Philadelphia, duty paid. | |
| Continental foundry, 1.80 to 2.50 sil. | $29.00 |
| Continental foundry, 2.50 to 3.25 sil. | 30.00 |
| Low phos. copper free, guar. not over 0.035 per cent phos. | $35.00 to 36.00 |
| Continental, phos. 1.50; sil. 2 to 3 | 29.50 |

**Ore.**—Large amounts of ore have come in at this port in the past two weeks. From Algeria 28,404 tons have been received; from Sweden, 25,612 tons; from Spain, 7530 tons; from Cuba, 5900 tons. Manganese ore was imported as follows: From Turkey in Europe, 440 tons; from Calcutta, India, 2500 tons; from British West Africa, 6832 tons; from Portuguese East Africa, 5000 tons.

**Ferroalloys.**—Domestic producers continue to quote ferromanganese at $125 for third quarter; for immediate shipment $130 is quoted. British selling agents have none to offer for early shipment, but for delivery later in the year are asking $125, seaboard. Last week's receipts of ferromanganese from England totaled 341 tons. England, Germany and Norway have each shipped 100 tons of ferrosilicon to this port.

**Semi-Finished Steel.**—Open-hearth rerolling billets are quoted at $45, Pittsburgh, forging billets at $52.50 to $55. A user of sheet bars has endeavored to buy a tonnage at $43, Pittsburgh, but apparently without success so far.

**Plates.**—A moderate volume of plate business is being placed, mostly in small lots. Some of the Pittsburgh-Youngstown mills are offering plates for third quarter at 2.50c., Pittsburgh, but Eastern mills have not come to that level, one holding at 2.60c. and others at 2.65c.

**Structural Material.**—The demand for structural shapes has dropped considerably, owing to the let-up in new building projects. An Eastern mill which had been quoting 2.75c., mill, has reduced its quotation to 2.50c., Pittsburgh, and can make fairly prompt shipments at this price. There are several new jobs pending, including an office building in Philadelphia, requiring 800 to 1000 tons, and a telephone building in Harrisburg, requiring 1600 tons. Bids will be received June 26 on the first section of the proposed Philadelphia subway extensions. Final approval of the work is being delayed by differences between factions in the city administration. If the work goes ahead it will require eventually 40,000 to 50,000 tons of steel.

**Bars.**—Steel bars are obtainable at 2.40c. to 2.50c., Pittsburgh, price depending somewhat upon delivery and the character of the specification. Not much business is being offered to the mills. Bar iron is quoted at 2.40c. to 2.50c., Pittsburgh.

**Sheets.**—Independent sheet mills which made third quarter contracts at prices higher than those of the American Sheet & Tin Plate Co. have been asked by some customers to revise quotations on such contracts to the lower level. A number of contracts were entered into at $3 to $5 a ton higher than the prices announced by the leading interest. Sheets are now generally obtainable for early delivery at 3c. for blue annealed, 3.85c. for black and 5c. for galvanized, Pittsburgh basis.

**Warehouse Business.**—Local warehouses will probably reduce prices $1 or $2 a ton for out-of-town trade, this being due to competition of jobbers in other cities. The reduction is expected to take effect this week. Prices for local delivery are unchanged.

Soft steel bars and small shapes, 3.55c.; iron bars (except bands), 3.55c.; round edge iron, 3.75c.; round edge steel, iron finished, 1½ x ½ in., 3.75c.; round edge steel planished, 4.55c.; tank steel plates, ¼ in. and heavier, 3.65c.; tank steel plates, ⅜ in., 3.95c.; blue annealed steel sheets, No. 10 gage, 4.25c.; black sheets, No. 28 gage, 5.15c.; galvanized sheets, No. 28 gage, 6.25c.; square twisted and deformed steel bars, 3.65c.; structural shapes, 3.65c.; diamond pattern plates, ¼-in., 5.40c.; ⅜-in., 5.60c.; spring steel, 5c.; round cold-rolled steel, 4.35c.; squares and hexagons, cold-rolled steel, 4.85c.; steel hoops, 1 in. and wider, No. 20 gage and heavier, 4.75c.; narrower than 1 in., all gages, 5.25c.; steel bands, No. 12 gage to ⅜-in., inclusive, 4.35c.; rails, 3.55c.; tool steel, 8.50c.; Norway iron, 7c.

**Coke.**—Varying prices are quoted on coke. Standard Connellsville furnace coke for prompt shipment is to be had at $5.25 to $5.50, Connellsville; on contract, $6. Standard Connellsville furnace coke is quoted at $5.75 to $6 for prompt shipment and at $7 for third quarter contracts. Keystone coke for third quarter is being contracted for at $7.50, ovens. Latrobe coke for prompt shipment is available at as low as $3.75, ovens.

**Old Material.**—The scrap market shows no signs of strength, but on the contrary, further declines have occurred within the past week. Very little business is being done.

We quote for delivery at consuming points in this district as follows:

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| No. 1 heavy melting steel | $18.00 to $19.00 |
| Scrap rails | 18.00 to 19.00 |
| Steel rails for rolling | 21.00 to 22.00 |
| No. 1 low phos., heavy 0.04 and under | 25.00 to 26.00 |
| Cast iron car wheels | 23.00 to 24.00 |
| No. 1 railroad wrought | 23.00 to 24.00 |
| No. 1 yard wrought | 20.00 to 21.00 |
| No. 1 forge fire | 17.00 to 18.00 |
| Bundled sheets (for steel works) | 16.50 to 17.00 |
| No. 1 busheling | 18.00 to 19.00 |
| Mixed borings and turnings (for blast furnace use) | 17.00 to 17.50 |
| Machine shop turnings (for steel works use) | 16.50 to 17.00 |
| Machine shop turnings (for rolling mill use) | 17.00 to 17.50 |
| Heavy axle turnings (or equivalent) | 18.00 to 19.00 |
| Cast borings (for steel works and rolling mills) | 17.00 to 17.50 |
| Cast borings (for chemical plants) | 21.00 to 22.00 |
| No. 1 cast | 23.00 to 24.00 |
| Heavy breakable cast (for steel plants) | 19.00 to 20.00 |
| Railroad grate bars | 18.50 to 19.00 |
| Stove plate (for steel plant use) | 17.00 to 18.00 |
| Railroad malleable | 22.00 to 24.00 |
| Wrought iron and soft steel pipes and tubes (new specifications) | 15.00 to 16.00 |
| Shafting | 24.00 to 26.00 |
| Steel axles | 24.00 to 26.00 |

# San Francisco

## Lower Pig Iron Prices Expected — General Tendency Toward Easier Conditions

SAN FRANCISCO, May 30.—While there is apparently no decreased activity in those branches of trade where iron and steel are prominent factors, business shows unmistakable evidence of slowing down. Prices show no material variation as compared with two weeks ago, but buyers seem inclined to hold off in providing for their third quarter requirements. Another feature worthy of note is the fact that trading for the time being is of larger volume in the San Francisco region than in the southern part of the State. This is the reverse of what it was a month ago, but whether it will continue is problematical. Considering the reports of uncertainty in some other markets, the general situation in this State remains satisfactory.

**Pig Iron.**—The strength so noticeable in the market for pig iron up to two weeks ago has given way to a feeling that prices may recede in the near future. At present they are held with a showing of firmness at from $36 to $42.50, depending, of course, upon analysis. There is practically no English or Scotch iron being offered in this market, and from present indications there will not be any for some time. Chinese iron is coming to hand in moderate quantities and serves the purposes of foundries satisfactorily. While the leading foundries still have some of the English iron on hand, and there is still a small tonnage on the way, the latter is all under contract for delivery, and therefore will not be offered. This leaves the market bare, and there will be very little, if any, on this coast until European conditions are changed. Importers say that there is a well-defined belief among buyers that the present high prices cannot continue much longer, and with this idea in view they are holding off, buying nothing except what they must have for immediate needs. The imports of iron by sea during May totaled 3290 tons, almost all from China.

**Finished Iron and Steel.**—There is a good demand for the present and judging from trade conditions the requirements for the next few months will be of liberal proportions, probably continuing until the end of the year. It has been predicted that the erection of new buildings would be greatly lessened by the high cost of labor and materials, but thus far there is no indication of such a result. Plans are now being prepared for several new structures in this city. The St. Francis Hotel is to have a large addition on its Post Street side and the American Can Co. will construct another plant for making cans in this city. Both of these buildings will require large steel tonnage. It is probable that the Columbia Steel Corporation will make the steel framework for the last-named building. Oakland, on the east side of the bay, is developing as a manufacturing center.

**Coke.**—Importers say there are no inquiries, business being at a standstill. High costs have made imports prohibitive and as there is none to offer there are no quotable prices, for the present, at least. Deliveries on earlier purchases are still being made, and it is calculated this will provide ample supplies until the end of August and possibly half way into September. The tonnage on the way is now comparatively small. Arrivals during May totaled only 288 tons, but as this was all under contract, none of it appeared on the market. Consumers are said to have supplies sufficient to carry them partly through the third quarter.

**Old Material.**—Market conditions continue substantially the same as two weeks ago, with prices about the same. The only variation apparent is an occasional shading of price. The range at present is from $13 to $14.50, although the last-named figure would only be paid for strictly first-grade material. It is expected that heavy melting steel will be quotably lower in the near future; in fact, there are reports current that more than one lot changed hands recently at about 50c. below the asking figure. Foundries are said to be well supplied for the present and confine their purchasing mostly to small lots.

# Cleveland

## Prices Are Easier and Demand Light—Heavy Movement of Ore

CLEVELAND, June 5.—During May there were 6,671,705 gross tons of Lake Superior ore shipped, which was more than had been expected, considering delays in the first half of the month, due to ice conditions. The total movement to June 1 was 6,685,889 tons, as compared with 1,721,466 tons during the same period last year. In 1920, when 58,527,226 tons were shipped, the movement to June 1 was 7,206,939 tons. With a good car supply for handling ore from lower lake docks and other conditions now favorable, a heavy movement is looked for in June. There is no activity in the market.

**Pig Iron.**—Inquiries for the third quarter and sales show an increase, although sufficient activity has not developed to indicate the start of a general buying movement. Some consumers appear to be closely watching the market, but have not decided whether to buy shortly or await developments. Others seem inclined to hold off until July and buy as needed. Many foundries will carry iron over into the third quarter, owing to the fact that because of the labor shortage their consumption during the present quarter has been below expectations. Prices show an easing tendency. Southern Ohio, where it was reported that considerable iron is being piled, appears to be the weakest market spot. The lowest reported price on foundry iron is $28.75, quoted by an Ironton furnace, but it seems probable that inquiries now pending will bring out lower prices. Some Southern Ohio iron is being sold by brokers. Among the inquiries is one from Columbus foundry for 1500 tons of malleable iron, which should prove a good test of the market. Valley prices have settled down to $29 and $29.50 on foundry iron. One producer reports a sale of a 600 and a 300-ton lot at the higher price. Buffalo iron is now commonly quoted at $29. Some malleable is being sold in Michigan by the Ford furnaces. Locally the market is inactive, and prices are established by Buffalo and Valley quotations. We note the sale to a Cleveland foundry of two car lots of 3 to 4 per cent silicon iron by a western New York furnace at $29.50, Buffalo, with a $1 silicon differential, making the delivered price $35.40. One lake furnace interest reports third quarter sales aggregating 4000 tons, including a 2000-ton lot of foun-

dry iron, and inquiries pending for the same amount, including a 2000-ton of foundry and malleable iron. Some lake furnaces that are well sold up for the third quarter are not disposed to meet the prevailing prices. Sales include a 500-ton lot of foundry iron to a Springfield, Ohio, consumer that was placed with an Ironton furnace. The Port Huron, Mich., foundry that recently inquired for 4000 tons of foundry iron has not yet placed its order. Two inquiries of basic iron for the third quarter have come out, one from the Valley direct for 2500 tons and the other from western Pennsylvania for 5000 tons. Sales of about 1000 tons of Tennessee iron running from 2.75 per cent silicon and higher are reported at $26, base, but this iron has all been disposed of, and Alabama producers appear to be holding firmly to $27 for foundry iron for the third quarter. However, this price can probably be shaded for early shipment.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a $3.02 freight rate from Jackson and $6 rate from Birmingham:

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|---|---|
| Basic, Valley furnace | $27.50 to $28.00 |
| Northern No. 2 fdy., sil. 1.75 to 2.25 | 30.77 to 31.65 |
| Southern fdy., sil. 1.75 to 2.25 | 32.00 to 33.00 |
| Malleable | 30.77 to 31.65 |
| Ohio silvery, 8 per cent | 42.52 |
| Standard low phos., Valley furnace | 36.00 |

**Coke.**—Foundry coke sales are limited to car lots. Good grades of standard Connellsville coke are quoted at $6 to $6.50, although there is a price range of from $5.75 to $7.50.

**Cast Iron Pipe.**—The City of Cleveland has placed 750 tons of cast iron pipe in various sizes at $58.50 per ton and 180 tons of 40-in. cast iron flanged pipe at $100 a ton with the United States Cast Iron Pipe & Foundry Co., the prices named being for delivery on the ground. Cleveland will receive bids June 22 for 1050 tons of 24-in. cast iron pipe.

**Bolts, Nuts and Rivets.**—Some inquiry has come out for bolts and nuts for the third quarter, and manufacturers say that they expect that the present quotations will prevail for that delivery. These prices are 10 per cent higher than those for which second quarter contracts were taken. Specifications continue fairly heavy. Rivet specifications are good, but there is very little new business. The ruling quotations are 3.25c. for structural and 3.35c. for boiler rivets, but shading of these prices is reported.

**Finished Iron and Steel.**—Sales have improved somewhat as compared with the previous two or three weeks, but consumers are placing orders cautiously and only for actual requirements. However, most consumers have good orders on the mill books and not a great deal of buying is expected during the next few weeks. Many consumers continue to press the mills for deliveries, but in the automobile field the pressure has disappeared and there have been a few suspensions. Automobile parts manufacturers report a slight falling off in orders, but there are no reports of suspension from this source. Advices from Detroit indicate that the curtailment in production by automobile plants so far has been very light and that car builders expect to keep up close to present production for several weeks. While some mills have caught up very little on deliveries, others are making better delivery promises on orders taken at regular prices and this is tending to eliminate premium prices which are no longer much in evidence. Mills able to make prompt shipment are still getting 2.50c. for steel bars, but the bulk of the business is going at 2.40c. Local mills have settled down to 2.65c. on plates, but the more common quotation is now 2.50c. and one Eastern mill is now quoting the latter price for early shipment. The demand for hot-rolled strip steel has eased up considerably and premium prices are disappearing. While usual quotations range from 3.15c. to 3.30c. on the wider gages of hoop and bands, shading of the lower price is reported. The inactivity in the building field has resulted in bringing out lower quotations by fabricators than a few weeks ago, this being particularly noticeable in the bids for 2500 tons for the Cleveland Public Library, which has not yet been placed.

Jobbers quote steel bars, 3.36c.; plates and structural shapes, 3.46c.; No. 9 galvanized wire, 3.70c.; No. 9 annealed wire, 3.25c.; No. 28 black sheets, 4.75c.; No. 28 galvanized sheets, 5.90c.; No. 10 blue annealed sheets, 3.90c. to 4.06c.; cold rolled rounds, 3.90c.; flats, squares and hexagons, 4.40c.; hoops and bands, 1 in. and wider and 20 gage or heavier, 4.16c.; narrower than 1 in. or lighter than No. 20 gage, 4.60c.

**Sheets.**—Quotations of 3.70c. have appeared on black sheets and 4.75c. on galvanized sheets, but it is claimed that these prices are being named only on excess mill stocks. Independent mills are generally now quoting the Steel Corporation's prices of 3.85c. for black and 5c. for galvanized. Blue annealed sheets are firm at 3c., at which orders can be placed for early shipment, although some mills are still asking 3.25c. Light plates in No. 10 gage are quoted at 3c. to 3.10c. Mill orders are light but jobbers' sales are holding up well.

**Reinforcing Bars.**—Weakness has developed in the rail steel reinforcing bar market. Some quotations of 2.35c. have appeared, or $1 a ton below the regular price. The small sizes are still held at 2.50c. New inquiry is light.

**Old Material.**—The volume of activity is limited to the sale of small lots of scrap mostly on cars to dealers for immediate delivery to mills on old contracts. There is no new buying by mills in the Cleveland and the Valley district, and the market is as dull as it has been for several weeks. Heavy melting steel has further declined and can be bought in small lots at $19, although dealers are asking up to $22. Low phosphorus scrap and rails under 3-ft. have also declined, but other prices are holding close to recent levels, although quotations are largely nominal and the market is weak. Borings and turnings are holding up better than most other grades because of a good demand from blast furnaces.

We quote per gross ton f.o.b. Cleveland as follows:

| | |
|---|---|
| Heavy melting steel | $19.00 to $20.00 |
| Rails for rolling | 22.25 to 23.00 |
| Rails under 3 ft. | 20.50 to 21.50 |
| Low phosphorus melting | 21.50 to 22.50 |
| Cast borings | 17.00 to 17.25 |
| Machine shop turnings | 16.75 to 17.00 |
| Mixed borings and short turnings | 16.50 to 16.75 |
| Compressed sheet steel | 18.00 to 18.50 |
| Railroad wrought | 17.00 to 18.00 |
| Railroad malleable | 25.00 to 25.50 |
| Light bundled sheet stampings | 12.75 to 13.00 |
| Steel axle turnings | 17.75 to 18.00 |
| No. 1 cast | 23.50 to 24.00 |
| No. 1 busheling | 16.00 to 17.00 |
| Drop forge flashings | 16.75 to 17.00 |
| Railroad grate bars | 17.00 to 18.00 |
| Stove plate | 17.00 to 18.00 |
| Pipes and flues | 13.00 to 13.50 |

## Detroit Scrap Prices Decline

DETROIT, June 5.—Further evidence of a softening in the scrap market in this district was recorded in the recent letting of 4000 tons of miscellaneous material on which prices registered a decline of from $1 to $3 per ton. Dealers predominated in the bidding with a smaller number than usual, and the mills are evidently postponing buying until the latest possible date.

The following prices are quoted on a gross ton basis f.o.b. cars, producers' yards, excepting stove plate, automobile cast and No. 1 machinery cast, which are quoted on a net ton basis:

| | |
|---|---|
| Heavy melting steel | $18.50 to $19.50 |
| Shoveling steel | 18.50 to 19.50 |
| No. 1 machinery cast | 23.00 to 24.00 |
| Cast borings | 14.50 to 15.00 |
| Automobile cast scrap | 25.00 to 27.00 |
| Stove plate | 19.00 to 20.00 |
| Hydraulic compressed | 17.50 to 18.00 |
| Turnings | 14.00 to 14.50 |
| Flashings | 13.75 to 14.25 |

## Santa Fe Buying Machine Tools

CHICAGO, June 5.—The Santa Fe has commenced to place orders against its pending machine tool list with the likelihood that it will complete purchases for about $300,000 worth of machine tools before the close of the week.

# FABRICATED STEEL BUSINESS

## Public Work Looms Large in Week's Developments and Railroad Work Small

**Over half of the lettings in fabricated steel work was for public work, including subways in New York, and public work, including subways for Philadelphia, and public service enterprises formed the bulk of inquiries. The week's awards for the larger jobs totaled about 12,500 tons, while new propositions would call for upward of 15,000 tons, without including the Philadelphia subways. The chief items of the week are the following:**

Public School No. 72, New York, 1000 tons, definitely awarded to Hedden Iron Construction Co.; previously awarded and then held up.

American Locomotive Co., shop at Schenectady, N. Y., 350 tons, to McClintic-Marshall Co.

Garage on East Forty-sixth Street, New York, 150 tons, to Easton Structural Steel Co.

Elks Building, Asbury Park, N. J., 150 tons, to Fagar Iron Works.

State bridge, Red Lake Falls, Minn., 120 tons, to American Bridge Co.

Missouri Pacific Railroad, one 5-panel through riveted truss span, 175 tons, to Virginia Bridge & Iron Co.

Highway bridges, Waukon, Iowa, 175 tons, to unnamed fabricator.

Church, Oak Park, Ill., 100 tons, to Duffin Iron Works.

Illinois Central Railroad, passenger station, Champaign, Ill., 250 tons, to McClintic-Marshall Co.

Rome Wire Works, addition to Buffalo branch, 200 tons, to Kellogg Structural Steel Co.

Vacuum Oil Co., Olean, N. Y., addition, 200 tons to Kellogg Structural Steel Co.

Apartment house, Boston, 400 tons, to Lehigh Structural Steel Co.

First National Bank, Boston, addition, 500 tons, to New England Structural Co.

Chamber of Commerce, Boston, addition, 500 tons, New England Structural Co.

American Woolen Co., Lawrence, Mass., boiler house, 150 tons, New England Structural Co.

Bridge work for Big Four and Peoria & Eastern railroads, 1200 tons; McClintic-Marshall Co. low bidder on 1000 tons, Bethlehem Steel Bridge Corporation low bidder on 200 tons.

Stadium for Terre Haute, Ind., Park Board, 250 tons, to Almira Iron Works.

New York Transit Commission, addition to Flushing, L. I., elevated railroad, 6200 tons, to McClintic-Marshall Co.

Philadelphia Electric Co., two coal towers, 175 tons, to unnamed fabricator.

### Structural Projects Pending

Inquiries for fabricated steel work include the following:

Public School No. 177, Brooklyn, 1300 tons; two or three other public schools, New York, totaling 800 tons.

Smith College gymnasium, Northampton, Mass., 200 tons.

Baltimore & Ohio Railroad, small bridges, 200 tons.

Miners' Bank, Wilkes-Barre, Pa., 500 tons.

American Car & Foundry Co., crane runway at Chicago, 450 tons.

American Piano Co., factory, New York, 1000 tons.

Cushman bakery, New York City, about 700 tons.

Public Library, Cleveland, 2185 tons; general contract awarded to Crowell & Little Construction Co.

Track elevation work for private freight terminal, Indianapolis, 300 tons.

Bishop-Cass Building, Denver, 300 tons.

St. Paul Gas & Light Co., St. Paul, Minn., plant, tonnage not yet estimated but expected to be several thousand tons; contract for foundation has been awarded.

Edison Electric Illuminating Co., Boston, addition, 700 tons.

Bridge work for Louisville & Nashville Railroad, 150 tons, bids being taken.

Coal conveyors and other miscellaneous work for power station at Grand Tower, Ill., 150 tons.

Chicago, Burlington & Quincy Railroad, bridge, 1000 tons.

Paul Revere and Moses Cleveland Schools, Cleveland, 200 tons, bids asked for.

General Accident, Fire & Life Insurance Co., building at Fourth and Walnut Streets, Philadelphia, 800 to 1000 tons.

Bell Telephone Co., building at Harrisburg, Pa., 1600 tons.

Philadelphia subways; bids will be taken June 26 on first section. Total requirements will be 40,000 to 50,000 tons for whole project, but commencement of actual work is in doubt owing to differences in city administration.

# RAILROAD EQUIPMENT BUYING

## About 2500 Cars and 50 Locomotives Bought and Repair Business Under Inquiry

**The subjoined items of railroad equipment business show purchases of 2475 steel and wooden cars, including also passenger train cars, 48 locomotives (44 for the Canadian National Railways) and considerable car repair inquiry. New equipment wanted includes 30 electric locomotives and 50 motor coaches.**

The Seaboard Air Line has placed 1100 steel underframe box cars with the Richmond Car Co., 400 composite hopper cars with the Virginia Bridge & Iron Co., 200 wooden box cars with the Tampa Drydock Co., 200 wooden box cars with the Georgia Car & Locomotive Co. and 100 wooden box cars with the Liberty Iron & Steel Co.

The Chicago, Milwaukee & St. Paul is inquiring for 500 steel underframes.

The Standard Oil Co. of Indiana is inquiring for 50 5-ton mine cars and 2 30-ton flat cars.

The St. Louis Southwestern is in the market for 15 caboose cars.

The Pacific Electric is inquiring for 50 motor coaches.

The Missouri Pacific has let repairs on 100 locomotives to the Morgan Engineering Co., Alliance, Ohio.

The Great Northern Railway is in the market for 30 electric locomotives.

The Missouri Pacific is asking for bids for repairing 250 freight cars.

The Chicago, Milwaukee & St. Paul is inquiring for bids on repairing 300 freight cars.

The Atlantic Coast Line wants 50 steel underframes for use on the Charleston & Western Carolina.

The Florida East Coast has ordered 200 box cars from the Mt. Vernon Car Mfg. Co. and 200 steel flat cars from the American Car & Foundry Co.

The Santa Fe has ordered 50 express refrigerator cars from the General American Car Co.

The Atlantic Coast Line has ordered 25 combination baggage and mail cars from the Osgood-Bradley Car Co.

The American Locomotive Co. has received the following orders for engines: Canadian National Railways for State Lines Central Vermont, 16 Consolidation type (227,000 lb.), 8 8-wheel switching (200,000 lb.); Grand Trunk Western lines, 10 Mikado type (300,000 lb.), 5 Pacific type (280,000 lb.), 5 8-wheel switching (200,000 lb.); Tennessee Central, 4 Mikado type (275,000 lb.).

New freight cars on order on May 15, according to the car service division of the American Railway Association, totaled 113,619. Of that number, box cars totaled 48,569; refrigerator cars, 14,228; coal cars, 45,742, and stock cars, 1925. During the first 15 days in May the carriers placed orders calling for the delivery of 147 new locomotives, which brought the total number on order on May 15 to 2103.

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**Hiram Swank's Sons, Inc., fire clay refractories, Johnstown, Pa., is converting the Clymer plant to manufacture runner brick, sleeves, nozzles, etc., beginning operations June 8. The plant is modern and has shipping connections with the Pennsylvania and New York Central railroads.**

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**A meeting of the general standardization committee and of the chairmen of the various sub-committees of the American Gear Manufacturers' Association, will be held at the Hotel Clifton, Niagara Falls, Ont., June 8 and 9.**

# Prices Finished Iron and Steel f.o.b. Pittsburgh

**Carload Lots**

### Plates

Sheared, tank quality, base, per lb.....2.50c.

### Structural Material

Beams, channels, etc., base, per lb.....2.50c.
Sheet piling .....2.65c.

### Iron and Steel Bars

Soft steel bars, base, per lb.....2.40c.
Soft steel bars, screw stock quality.....$3 per ton over base
Reinforcing steel bars, base.....2.40c.
Refined iron bars, base, per lb.....3.25c.
Double refined iron bars, base, per lb.....4.85c. to 5.00c.
Stay bolt iron bars, base, per lb.....8.00c. to 8.50c.

### Hot-Rolled Flats

Hoops, ordinary gages and widths, base, per lb.....3.30c.
Hoops, light gage, under 1 in. wide.....3.50c.
Bands, base, per lb.....3.30c.
Strips, base, per lb.....3.30c.
Cotton ties, per bundle of 45 lb.....$1.60

### Cold-Finished Steels

Bars and shafting, base, per lb.....3.25c.
Strips, base, per lb.....5.25c.

### Wire Products

Nails, base, per keg.....$3.00
Galvanized nails, 1 in. and over.....$2.25 over base
Galvanized nails, less than 1 in..... 2.50 over base
Bright plain wire, base, No. 9 gage, per 100 lb..... 2.75
Annealed fence wire, base, per 100 lb..... 2.90
Spring wire, base, per 100 lb..... 3.70
Galvanized wire, No. 9, base, per 100 lb..... 3.35
Galvanized barbed, base, per 100 lb..... 3.80
Galvanized staples, base, per keg..... 3.80
Painted barbed wire, base, per 100 lb..... 3.45
Polished staples, base, per keg..... 3.45
Cement coated nails, base, per count keg..... 2.70
Woven fence, carloads (to jobbers).....67½ per cent off list
Woven fence, carloads (to retailers).....65 per cent off list

### Bolts and Nuts

Machine bolts, small, rolled threads.....50 per cent off list
Machine bolts, small, cut threads....40 and 10 per cent off list
Machine bolts, larger and longer....40 and 10 per cent off list
Carriage bolts, ⅜ x 6 in.:
  Smaller and shorter, rolled threads.....45 per cent off list
  Cut threads .....40 per cent off list
  Longer and larger sizes.....40 per cent off list
Lag bolts .....50 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....40 and 10 per cent off list
  Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.:
  Smaller and shorter .....35 and 5 per cent off list
  Larger and longer sizes.....35 and 5 per cent off list
Hot pressed square or hex. nuts, blank.....$3.00 off list
Hot pressed nuts, tapped ..... 2.75 off list
C.p.c. and t. square or hex. nuts, blank..... 3.00 off list
C.p.c. and t. square or hex. nuts, tapped..... 2.75 off list
Semi-finished hex. nuts:
  ⅞ in. and smaller, U. S. S.....75 and 5 per cent off list
  ⅝ in. and larger, U. S. S.....70 and 2½ per cent off list
  Small sizes, S. A. E.....75, 10 and 5 per cent off list
  S. A. E., ⅝ in. and larger.....75, 10 and 2½ per cent off list
Stove bolts in packages.....75, 10 and 5 per cent off list
Stove bolts in bulk.....75, 10, 5 and 2½ per cent off list
Tire bolts .....50, 10 and 10 per cent off list

### Cap and Set Screws

Milled square and hex. head cap screws,
  70 and 10 per cent off list
Milled set screws.....70 and 10 per cent off list
Upset cap screws.....75 per cent off list
Upset set screws .....75 per cent off list

### Rivets

Large structural and ship rivets, base, per 100 lb.....$3.25
Large boiler rivets, base, per 100 lb..... 3.35
Small rivets .....60 and 10 to 60 and 5 off list

### Track Equipment

Spikes, ⅜ in. and larger, base, per 100 lb..... $3.15
Spikes, ½-in., ⅝ in. and ¾ in., per 100 lb..... 3.75
Spikes, ⅞ in..... 3.75
Spikes, boat and barge, base, per 100 lb.....$3.50 to 3.75
Track bolts, ¾ in. and larger, base, per 100 lb.. 4.25 to 4.50
Track bolts, ½ in. and ⅝ in., base, per 100 lb.. 5.50
Tie plates, per 100 lb..... 2.60 to 2.75
Angle bars, base, per 100 lb..... 2.75

### Welded Pipe

*Butt Weld*

| Steel | | | Iron | | |
|---|---|---|---|---|---|
| Inches | Black | Galv. | Inches | Black | Galv. |
| ⅛ ..... | 45 | 19½ | ¼ to ⅜..... | +11 | +39 |
| ¼ to ⅜..... | 51 | 25½ | ½ ..... | 22 | 2 |
| ½ ..... | 56 | 42½ | ¾ ..... | 28 | 11 |
| ¾ ..... | 60 | 48½ | 1 to 1½.... | 30 | 13 |
| 1 to 3..... | 62 | 50½ | | | |

*Lap Weld*

| | | | | | |
|---|---|---|---|---|---|
| 2 ..... | 55 | 43½ | 2 ..... | 23 | 7 |
| 2½ to 6..... | 59 | 47½ | 2½ ..... | 26 | 11 |
| 7 and 8..... | 56 | 43½ | 3 to 6..... | 28 | 13 |
| 9 and 10..... | 54 | 41½ | 7 to 12..... | 26 | 11 |
| 11 and 12.... | 53 | 40½ | | | |

*Butt Weld, extra strong, plain ends*

| | | | | | |
|---|---|---|---|---|---|
| ⅛ ..... | 41 | 24½ | 2 to 3..... | 61 | 50½ |
| ¼ to ⅜..... | 47 | 30½ | ¼ to ⅜.....+19 | | +54 |
| ½ ..... | 53 | 42½ | ½ ..... | 21 | 7 |
| ¾ ..... | 58 | 47½ | ¾ ..... | 28 | 12 |
| 1 to 1½..... | 60 | 49½ | 1 to 1½..... | 30 | 14 |

*Lap Weld, extra strong, plain ends*

| | | | | | |
|---|---|---|---|---|---|
| 2 ..... | 53 | 42½ | 2 ..... | 23 | 9 |
| 2½ to 4..... | 57 | 46½ | 2½ to 4..... | 29 | 15 |
| 4½ to 6..... | 56 | 45½ | 4½ to 6..... | 28 | 14 |
| 7 to 8..... | 52 | 39½ | 7 to 8..... | 21 | 7 |
| 9 and 10.... | 45 | 32¼ | 9 to 12..... | 16 | 2 |
| 11 and 12.... | 44 | 31¼ | | | |

To the large jobbing trade the above discounts are increased by one point, with supplementary discount of 5 per cent on black and 1½ points, with a supplementary discount of 5 per cent, on galvanized.

### Boiler Tubes

| *Lap Welded Steel* | | *Charcoal Iron* | |
|---|---|---|---|
| 2 to 2¼ in..... | 27 | 1½ in.....+18 | |
| 2½ to 2¾ in..... | 37 | 1¾ to 1⅞ in.....+ 8 | |
| 3 in ..... | 40 | 2 to 2¼ in.....— 2 | |
| 3¼ to 3¾ in..... | 42½ | 2½ to 3 in.....— 7 | |
| 4 to 13 in..... | 46 | 3¼ to 4½ in.....— 9 | |

Less carload lots 4 points less.

*Standard Commercial Seamless Boiler Tubes*

*Cold Drawn*

| | | | |
|---|---|---|---|
| 1 in. ..... | 55 | 3 and 3¼ in..... | 36 |
| 1¼ and 1½ in..... | 47 | 3½ and 3¾ in..... | 37 |
| 1¾ in. ..... | 31 | 4 in. ..... | 41 |
| 2 and 2¼ in..... | 22 | 4½ in . and 5 in..... | 33 |
| 2½ and 2¾ in..... | 32 | | |

*Hot Rolled*

| | | | |
|---|---|---|---|
| 3 and 3¼ in..... | 38 | 4 in. ..... | 43 |
| 3½ in. and 3¾ in.... | 39 | | |

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of net larger outside diameter and heavier gage.

*Seamless Mechanical Tubing*

Carbon under 0.30, base.....83 per cent off list
Carbon 0.30 to 0.40, base.....81 per cent off list
Plus usual differentials and extras for cutting. Warehouse discounts range higher.

*Seamless Locomotive and Superheater Tubes*

| | Cents per Ft. | | Cents per Ft. |
|---|---|---|---|
| 2-in. O.D. 12 gage..... | 15 | 2¼-in. O.D. 10 gage... | 20 |
| 2-in. O.D. 11 gage..... | 16 | 3-in. O.D. 7 gage..... | 35 |
| 2-in. O.D. 10 gage..... | 17 | 1½-in. O.D. 9 gage.... | 15 |
| 2¼-in. O.D. 12 gage... | 17 | 5⅜-in. O.D. 9 gage.... | 55 |
| 2¼-in. O.D. 11 gage... | 18 | 5½-in. O.D. 9 gage.... | 57 |

### Tin Plate

Standard cokes, per base box.....$5.50 to $5.75

### Terne Plate

(Per package, 20 x 28 in.)

| | |
|---|---|
| 8-lb. coating, 100 lb base .....$11.00 | 20-lb. coating I. C....$14.90 |
| 8-lb. coating I. C.... 11.30 | 25-lb. coating I. C.... 16.20 |
| 12-lb. coating I. C..... 12.70 | 30-lb. coating I. C.... 17.35 |
| 15-lb. coating I. C.... 13.95 | 35-lb. coating I. C.... 18.35 |
| | 40-lb. coating I. C.... 19.35 |

### Sheets

*Blue Annealed*

Nos. 9 and 10 (base), per lb.....3.00c.

*Box Annealed, One Pass Cold Rolled*

No. 28 (base), per lb.....3.85c.

*Automobile Sheets*

Regular auto body sheets, base (22 gage), per lb.....5.35c.

*Galvanized*

No. 28 (base), per lb.....5.00c.

*Long Ternes*

No. 28 gage (base), 8-lb. coating, per lb.....5.30c.

*Tin-Mill Black Plate*

No. 28 (base), per lb.....3.85c.

Manufactures have pamphlets, which can be had upon application, giving price differentials for gage and extras for length, width, shearing, etc.

## Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

| | | | | | |
|---|---|---|---|---|---|
| Philadelphia, domestic. | $0.32 | Buffalo | $0.265 | St. Louis | $0.43 |
| Philadelphia, export... | 0.235 | Cleveland | 0.215 | Kansas City | 0.735 |
| Baltimore, domestic... | 0.31 | Cleveland, Youngstown | | Kansas City (pipe)... | 0.705 |
| Baltimore, export..... | 0.225 | Comb. | 0.19 | St. Paul | 0.60 |
| New York, domestic... | 0.34 | Detroit | 0.29 | Omaha | 0.735 |
| New York, export..... | 0.255 | Cincinnati | 0.29 | Omaha (pipe)..... | 0.705 |
| Boston, domestic..... | 0.365 | Indianapolis | 0.31 | Denver | 1.27 |
| Boston, export..... | 0.255 | Chicago | 0.34 | Denver (pipe) | 1.215 |

| | |
|---|---|
| Pacific Coast | $1.34 |
| Pac. Coast, ship plates | 1.20 |
| Birmingham | 0.69 |
| Memphis | 0.385 |
| Jacksonville, all rail.. | 0.50 |
| Jacksonville, rail and water | 0.415 |
| New Orleans | 0.515 |

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 30c. to 40c.; ship plates, 30c. to 40c.; ingot and muck bars, structural steel, common wire products including cut or wire nails, spikes, and wire hoops, 30c. to 40c.; sheets and tin plates, 30c. to 40c.; rods, wire rope cable and strands, 75c.; wire fencing, netting and stretcher, 49c.; pipes not over 8 in. in diameter, 50c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

# Prices of Raw Materials, Semi-Finished and Finished Products

## Ores

*Lake Superior Ores, Delivered Lower Lake Ports*

| | |
|---|---|
| Old range Bessemer, 55 per cent iron | $6.45 |
| Old range non-Bessemer, 51½ per cent iron | 5.70 |
| Messabi Bessemer, 55 per cent iron | 6.20 |
| Messabi non-Bessemer, 51½ per cent iron | 5.55 |

*Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore*

| | |
|---|---|
| Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian | 11½c. |
| Iron ore, Swedish, average 66 per cent iron | 11c. to 11.25c. |
| Manganese ore, washed, 51 per cent manganese, from the Caucasus, nominal | 48c. |
| Manganese ore, ordinary, 48 per cent manganese, from the Caucasus | 42c. |
| Manganese ore, Brazilian or Indian, nominal | 45c. |
| Tungsten ore, per unit, in 60 per cent concentrates | $8.50 |
| Chrome ore, basic, 48 per cent $Cr_2O_3$, crude, per ton, c.i.f. Atlantic seaboard | 18.00 to 28.00 |
| Molybdenum ore, 85 per cent concentrates, per lb. of $MoS_2$, New York | 75c. to 85c. |

## Ferroalloys

| | |
|---|---|
| Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton | $120.00 to $130.00 |
| Ferromanganese, British, 80 per cent, f.o.b. Atlantic port, duty paid | 125.00 to 130.00 |
| Spiegeleisen, domestic, 19 to 21 per cent, per ton | 45.00 to 47.50 |
| Spiegeleisen, domestic, 16 to 19 per cent, furnace, per ton, nominal | 43.00 |
| Ferrosilicon, 50 per cent, delivered per gross ton | 92.50 to 95.00 |
| Ferrosilicon, Bessemer, 10 per cent, per ton, furnace | 48.50 |
| Ferrosilicon, Bessemer, 11 per cent, per ton, furnace | 51.80 |
| Ferrosilicon, Bessemer, 12 per cent, per ton, furnace | 55.10 |
| Ferrosilicon, Bessemer, 13 per cent, per ton, furnace | 59.10 |
| Ferrosilicon, Bessemer, 14 per cent, per ton, furnace | 64.10 |
| Silvery iron, 6 per cent, per ton, furnace | 37.00 |
| Silvery iron, 7 per cent, per ton, furnace | 38.00 |
| Silvery iron, 8 per cent, per ton, furnace | 39.50 |
| Silvery iron, 9 per cent, per ton, furnace | 41.50 |
| Silvery iron, 10 per cent, per ton, furnace | 43.50 |
| Silvery iron, 11 per cent, per ton, furnace | 46.80 |
| Silvery iron, 12 per cent, per ton, furnace | 50.10 |
| Ferrotungsten, per lb. contained metal | 88c. to 90c. |
| Ferrochromium, 4 to 6 per cent carbon, 60 to 70 per cent Cr. per lb. contained Cr. delivered | 12c. |
| Ferrochromium, 6 to 7 per cent carbon, 60 to 70 per cent Cr., per lb. | 11.50c. |
| Ferrovanadium, per lb. contained vanadium | $3.50 to $4.00 |
| Ferrocarbontitanium, 15 to 18 per cent, per net ton | 200.00 |

## Fluxes and Refractories

| | |
|---|---|
| Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica per net ton f.o.b. Illinois and Kentucky mines | $22.00 |
| Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica per net ton, f.o.b. Illinois and Kentucky mines | 23.50 |

Per 1000 f.o.b. works:

| Fire Clay: | High Duty | Moderate Duty |
|---|---|---|
| Pennsylvania | $48.00 to $51.00 | $43.00 to $46.00 |
| Ohio | 45.00 to 47.00 | 40.00 to 43.00 |
| Kentucky | 45.00 to 47.00 | 42.00 to 45.00 |
| Illinois | 48.00 to 50.00 | 45.00 to 47.00 |
| Missouri | 48.00 to 50.00 | 38.00 to 43.00 |
| Ground fire clay, per net ton | | 6.50 to 9.50 |

| | |
|---|---|
| Silica Brick: | |
| Pennsylvania | 47.00 |
| Chicago | 52.00 |
| Birmingham | 48.00 |
| Ground silica clay, per net ton | 10.00 |
| Magnesite Brick: | |
| Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.) | 65.00 |
| Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.) | 40.00 |
| Chrome Brick: | |
| Standard size, per net ton | 50.00 |

## Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown, per gross ton

| | |
|---|---|
| Rolling billets, 4-in. and over | $43.00 to $45.00 |
| Rolling billets, 2-in. and under | 45.00 |
| Forging billets, ordinary carbons | 55.00 |
| Sheet bars, Bessemer | 45.00 |
| Sheet bars, open-hearth | 45.00 |
| Slabs | 45.00 |
| Wire rods, common soft, base, No. 5 to ¼-in. | 51.00 |
| Wire rods, common soft, coarser than ¼-in. | $2.50 over base |
| Wire rods, screw stock | $5 per ton over base |
| Wire rods, carbon 0.20 to 0.40 | $3 per ton over base |
| Wire rods, carbon 0.41 to 0.55 | $5 per ton over base |
| Wire rods, carbon 0.56 to 0.75 | $7.50 per ton over base |
| Wire rods, carbon over 0.75 | $10 per ton over base |
| Wire rods, acid | $15 per ton over base |
| Skelp, grooved, per lb. | 2.45 |
| Skelp, sheared, per lb. | 2.45 |
| Skelp, universal, per lb. | 2.45 |

## Finished Iron and Steel, f.o.b. Mill

| | |
|---|---|
| Rails, heavy, per gross ton | $43.00 |
| Rails, light, new steel, base, per lb. | 2.25c. |
| Rails, light, rerolled, base, per lb. | 2.15c. to 2.20c. |
| Spikes, ⅝-in. and larger, base, per 100 lb. | $3.15 to $3.25 |
| Spikes, ½-in., ⅝-in. and ⅝-in., base, per 100 lb. | 3.25 to 3.75 |
| Spikes, ⅜-in., base, per 100 lb. | 3.25 to 3.75 |
| Spikes, boat and barge, base, per 100 lb. | 3.50 to 3.75 |
| Track bolts, ⅝-in. and smaller, base, per 100 lb. | 4.25 to 5.50 |
| Track bolts, ¾-in. and larger, base, per 100 lb. | 4.25 to 4.50 |
| Tie plates, per 100 lb. | 2.55 to 2.60 |
| Angle bars, per 100 lb. | 2.75 |
| Bars, common iron, base, per lb. | 2.50c. to 2.60c. |
| Bars, rail, steel reinforcing, base, per lb. | 2.15c. to 2.25c. |
| Ground shafting, base, per lb. | 3.65c. |
| Cut nails, base, per keg | $3.40 |

## Alloy Steel

| S.A.E. Series Numbers | Bars 100 lb. |
|---|---|
| 2100 (½% Nickel, 10 to 20 per cent Carbon) | $3.75 |
| 2300 (3½% Nickel) | $5.50 to 5.75 |
| 2500 (5% Nickel) | 5.25 |
| 3100 (Nickel Chromium) | 4.75 |
| 3200 (Nickel Chromium) | 6.50 |
| 3300 (Nickel Chromium) | 8.50 |
| 3400 (Nickel Chromium) | 7.50 |
| 5100 (Chromium Steel) | 4.25 |
| 5200 (Chromium Steel) | 8.50 |
| 6100 (Chromium Vanadium bars) | 5.25 to 5.50 |
| 6100 (Chromium Vanadium spring steel) | 5.00 to 5.25 |
| 9250 (Silico Manganese spring steel) | 4.25 |
| Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium) | 5.75 |
| Chromium Molybdenum bars (0.70—1 Chromium, 0.25—0.40 Molybdenum) | 5.00 to 5.25 |
| Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum) | 4.75 |
| Chromium Molybdenum spring steel (0.50—0.70 Chromium, 0.15—0.25 Molybdenum) | 4.50 to 4.75 |

Above prices are for hot-rolled alloy steel bars, forging quality, per 100 lb. f.o.b. Pittsburgh. Billets 4 x 4 in. and larger are $10 per gross ton less than net ton price for bars of same analyses. On smaller than 4 x 4-in. billets down to and including 2½-in. sq. there is a size extra of $10 per gross ton: on billets smaller than 2½-in. sq. the net ton bar price applies.

## Domestic Tin Plant to Close

The American Smelting & Refining Co. will close its tin smelter at Perth Amboy, N. J., July 1, owing to inability to get further supplies of Bolivian tin concentrates in competition with English tin smelters which are able to smelt at much lower cost because of cheaper labor and supplies.

It is understood that the only other tin smelter still operating in the United States will close about July 31. All five smelters in the United States will thus have been shut down owing to failure of Congress to place a tariff upon tin, according to the contention of the companies.

## Base Rate for Pudding Advanced

YOUNGSTOWN, June 5.—An increase of $1 per ton in the base rate for puddling, for the scale year beginning July 1, is granted in a new wage agreement negotiated between the Western Bar Iron Association and the Amalgamated Association of Iron, Steel and Tin Workers. The conferees have been meeting in Atlantic City.

Shortage of puddlers, making it impossible for puddle furnaces to work at normal, was a factor in bringing about the advance. Owing to the labor situation, puddle furnace operations have been held to 70 per cent for several months.

# NON-FERROUS METALS

## The Week's Prices

Cents per Pound for Early Delivery

| | Copper, New York | | Straits Tin | Lead | | Zinc | |
|---|---|---|---|---|---|---|---|
| May | Lake | Electrolytic* | New York | New York | St. Louis | New York | St. Louis |
| 29..... | 15.37½ | 14.75 | 42.20 | 7.30 | 7.05 | 6.75 | 6.40 |
| 31..... | 15.37½ | 14.62½ | 42.62½ | 7.30 | 7.05 | 6.77½ | 6.42½ |
| June | | | | | | | |
| 1..... | 15.37½ | 14.62½ | 41.75 | 7.30 | 7.05 | 6.80 | 6.45 |
| 2..... | 15.25 | 14.62½ | .... | 7.30 | 7.05 | 6.77½ | 6.42½ |
| 4..... | 15.25 | 14.75 | 41.75 | 7.30 | 7.05 | 6.75 | 6.40 |
| 5..... | 15.25 | 14.75 | 41.87½ | 7.30 | 7.05 | 6.75 | 6.40 |

*Refinery quotation; delivered price ¼c. higher.

## New York

NEW YORK, June 5.

The markets are quiet and there is very little change in general conditions. Copper, after further weakness, is a little stronger. The tin market is quiet but stable. There has been very little change in the lead market either as to buying or prices. Zinc, after strengthening a little, is again easier.

**Copper.**—The moderate demand for electrolytic copper which developed a week ago was short lived. Consumers continue to be conservative and are apparently entering the market only when justified by the receipt of sufficient orders for finished material. Thus far such orders are not appearing in as great volume as copper producers had expected. This condition, together with the effect of changing prices in London, resulted in lower prices toward the end of last week when electrolytic touched the lowest price on this movement of 14.87½c., delivered. Since then there has been a slight improvement due to a little better inquiry, an improvement in export demand and to a stiffer London market, so that today electrolytic copper is quoted at 15c., delivered, as a minimum, with some producers asking 15.12½c. Some business is reported at the minimum quotation referred to. Lake copper is quiet at 15.25c., delivered.

**Copper Averages.**—The average price for Lake copper for the month of May, based on daily quotations in THE IRON AGE, was 16.12½c. The average price for electrolytic copper was 15.54, refinery, or 15.79c., delivered.

**Tin.**—The week has been quiet to dull and uninteresting, with the holiday on May 30 accentuating these conditions. On May 28 the market was fairly active, with a turnover of 400 to 500 tons of Straits tin. The other days since have been exceedingly quiet, with the market nearly stagnant on June 1. Because of the probability of a light supply of metal in July and August, sellers have expected a fairly active market and the apathy of consumers has been a surprise. It is clear from this, however, that the latter have covered their requirements further ahead than anyone had any idea of. The statistics for May were also a surprise. There have been expectations of a decrease of 1000 or more tons in the world's visible supply, but data showed an increase of 71 tons. Consumers have not come into the market as expected, following the publication of these statistics, and the market has been generally dull. Yesterday, June 4, about 200 tons changed hands at 41.50c. to 41.75c., mostly futures. Spot Straits tin today was quoted at 41.87½c., New York, and the London market is only slightly higher than a week ago at £197 15s. for spot and future standard each, and £200 15s. for spot Straits. For the month of May arrivals of tin were 5590 tons and the deliveries for the month were 6035 tons, with 3132 tons in stock and landing on May 31. Imports for the first five months this year have been 31,682 tons. Arrivals thus far this month have been 635 tons, with 7548 tons afloat.

**Lead.**—This market continues quiet and fairly steady, with prices unchanged. That there are signs of an easing tendency is admitted by some. The leading interest continues to quote 7.35c., New York, for early delivery, with independent sellers asking 7.30c., New York, and 7.05c., St. Louis. Imported lead has ceased to be a factor, for the present at least.

**Zinc.**—There was a temporary strengthening in prime Western last week and slightly better buying by consumers and improved inquiry, with the result that prices advanced about five points. Since then, due partly to pressure from some quarters to sell, the market has again eased off to the level which prevailed a week ago, or 6.40c., St. Louis, and 6.75c., New York, for June delivery. Demand is light and the market is quiet and featureless.

**Nickel.**—Quotations for shot and ingot metal are unchanged at 29c. to 32c. per lb. with electrolytic nickel held at 32c. by the leading producer. In the outside spot market quotations for shot and ingot nickel are 29c. to 32c. per lb.

**Antimony.**—The market is unchanged, with wholesale lots of Chinese metal for early delivery quoted at 7c. to 7.15c. per lb., New York, duty paid.

**Aluminum.**—Virgin metal, 98 to 99 per cent pure, is quoted in wholesale lots for early delivery by such importers as can deliver the metal at 26.50c. to 27c. per lb., New York, duty paid. The leading producer makes public no quotations.

**Old Metals.**—The market is more active and the outlook seems brighter. Dealers' selling prices are as follows:

| | Cents Per Lb. |
|---|---|
| Copper, heavy and crucible | 14.75 |
| Copper, heavy and wire | 13.75 |
| Copper, light and bottoms | 11.50 |
| Heavy machine composition | 11.50 |
| Brass, heavy | 8.75 |
| Brass, light | 7.00 |
| No. 1 red brass or composition turnings | 9.75 |
| No. 1 yellow red brass turnings | 7.75 |
| Lead, heavy | 6.50 |
| Lead, tea | 5.50 |
| Zinc | 5.00 |

## Chicago

June 5.—There have been further declines in tin, lead, zinc and antimony and, owing to the dearth of buying, prices are almost nominal. Old metal quotations are unchanged. We quote, in carload lots, lake copper, 16c.; tin, 43c.; lead, 7.05c.; spelter, 6.50c.; antimony, 8.50c. in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 12.50c.; copper bottoms, 10.50c.; red brass, 8.75c.; yellow brass, 7c.; lead pipe, 5c.; zinc, 4c.; pewter, No. 1, 25c.; tin foil, 29c.; block tin, 35c.; all buying prices for less than carload lots.

## Trans-Pacific Magazine Now a Weekly Newspaper

Beginning with a first issue on May 12, the *Trans-Pacific*, a review of Far Eastern political, social and economic developments, published in Tokio, Japan, was changed from a monthly magazine to a weekly newspaper. The new publication has 24 pages, 17 x 12½ in. in size. The publishers' announcement in the first issue explains the reason for the change as follows: "The *Trans-Pacific* weekly will deal not only with economic and industrial matters, to which the monthly magazine was confined, but also will cover completely the broader field of politics, noting the tendencies of significant social movements and providing an easily accessible compendium of the general news of the East."

The new building to be erected for the Westinghouse Electric & Mfg. Co., Cleveland, will be used by the company as a central distributing plant for the Cleveland territory. This building will occupy 113 ft. on Ashland Road, the same frontage on the Pennsylvania Railroad at Cedar Avenue, and will be 130 ft. deep. It will be a five-story fireproof structure, providing 75,000 sq. ft. of floor space.

# STEEL AND INDUSTRIAL STOCKS

## Early Strength Dwindles Toward Close on Bearish Influence—Sharp Gain in Crucible

Like the public mood, the market in steel and industrial stocks seems uncertain about the ebb in business. Before the holiday, there was a rally in Steel, and industrials were especially strong, American Locomotive moving up to 70¼. Crucible rose suddenly to 74¼ on dividend talk, the rumor coming through a large buyer that a dividend of about $4 annually will be declared at the meeting this month. Bethlehem Steel for six weeks has tended downward and this still seems its way. Attention was directed to Colorado Fuel, which crossed 35 and registered a new high record. From Friday on, the market was subject to strong bearish operations. Selling for a time was rampant. Most significant in recent market movements is the lack of uniformity and general leaning back to avoid bullishness. However, at the closing Crucible rose to 71½, Steel advanced and Colorado Fuel broke with a 2-point jump, obviously on the strength of its oil ventures.

The range of prices on active steel and industrial stocks from Monday of last week to Monday of this week are as follows:

| | Low | High | | Low | High |
|---|---|---|---|---|---|
| Allis-Chalmers... | 39¾ | 43¾ | Lima Loco. .... | 63¾ | 67¾ |
| Allis-Chal. pf.... | 93 | 93 | Lima Loco. pf... | 133½ | 133½ |
| Am. B. S. & Fdy. | 74½ | 75¾ | Midvale Steel .. | 26½ | 27⅝ |
| Am. Can ..... | 96⅛ | 104⅜ | Nat. En. & Stm.. | 63¾ | 66¼ |
| Am. Can pf..... | 109½ | 110 | N. Y. Air Brake. | 35¼ | 37½ |
| Am. Car & Fdy.. | 170 | 172¾ | Nova Scotia Stl.. | 25½ | 25¼ |
| Am. Car & F. pf. | 121¼ | 121¼ | Otis Steel ..... | 9½ | 10¾ |
| Am. Loco. ..... | 136¼ | 143¾ | Otis Steel pf.... | 55½ | 55½ |
| Am. Loco. pf... | 116½ | 117½ | Pressed Steel .. | 56 | 56½ |
| Am. Radiator .. | 80½ | 81½ | Ry. Stl. Spring.. | 108 | 114 |
| Am. Steel Fdries. | 36 | 37½ | Ry. Stl. Sp. pf.. | 116¼ | 116½ |
| Bald. Loco. .... | 126 | 136¼ | Replogle Steel .. | 19 | 21 |
| Beth. Steel ..... | 50⅝ | 55½ | Republic ..... | 48¼ | 53⅛ |
| Beth. Stl. pf. new | 90½ | 90½ | Republic pf. .... | 95¼ | 95¼ |
| Beth. Stl. 8% pf. | 104⅝ | 104⅝ | Sloss-Sheffield... | 49¼ | 52½ |
| Brier Hill ..... | 17¾ | 17¾ | Steel of Canada. | 74½ | 75¼ |
| Chic. Pneu. Tool | 77 | 77 | Transue-Williams | 30 | 35 |
| Colo. Fuel ..... | 31½ | 35⅜ | Un. Alloy Steel.. | 34⅞ | 35 |
| Crucible Steel... | 68⅝ | 74¼ | U. S. Pipe..... | 25 | 26⅛ |
| Crucible Stl. pf.. | 89 | 89 | U. S. Pipe pf.... | 67¼ | 71¼ |
| Deere pf. ..... | 68 | 70 | U. S. Steel..... | 94⅜ | 99½ |
| Gen. Electric ... | 173½ | 180¼ | U. S. Steel pf... | 117¼ | 118½ |
| Gt. No. Ore Cert. | 28⅝ | 30 | Vanadium Steel.. | 31¼ | 33⅞ |
| Gulf States Steel | 80¾ | 86½ | Va. I., C. & Coke | 59 | 59½ |
| Inland Steel .... | 38½ | 39½ | W'house Air Br.. | 84⅛ | 85⅞ |
| Int. Harvester ... | 81½ | 84½ | | | |

## Industrial Finances

The Gurney Foundry Co., Ltd., of Canada, has sold $1,200,000 6½ per cent first mortgage coupon bonds maturing in from one to 15 years to bankers, who have disposed of the issue.

A public offering of $10,000,000 Associated Simmons Hardware Companies 6½ per cent 10-year notes is being made. Proceeds will be used to retire outstanding 7 per cent notes, for the reduction of current liabilities and to provide for business expansion.

According to a statement recently issued by Reed-Prentice Co., Worcester, Mass., machine tools, the company last year operated at a net loss of $207,138. The balance sheet as of Dec. 31, last, shows total assets and liabilities of $2,417,977, against $2,270,407 at the close of 1921 and $2,977,493 at the end of 1920. No profit and loss surplus appears in the statement, whereas $128,758 was shown in the 1921 statement and $513,176 in the 1920. The company last year, however, set up an inventory reserve of $200,000, something it heretofore has not maintained. In view of the fact that the Becker Milling Machine Co. and the Whitcomb-Blaisdell Machine Tool Co. were absorbed by the company, the 1922 report is more encouraging than appears at first blush.

Stockholders of the Truscon Steel Co. at a special meeting in Detroit, May 29, were informed by President Julius Kahn that the company is increasing the dividend rate on common stock to 12 per cent per annum from 7 per cent. The stockholders approved an increase in capital stock of $1,500,000, making a total of $8,000,000, and voted to offer 100,000 shares of treasury common stock, par value $10, to the shareholders for subscription at $15 a share. Of the new stock authorized $1,000,000 will be preferred and $500,000 common stock. With approximately 127,000 shares of the old common stock in the company's treasury, the offering of 100,000 shares will leave only about 27,000 shares of common stock in the treasury.

The National Lathe Co., 15 West Second Street, Cincinnati, has been placed in the hands of a receiver, Paul Stewart, Paul Stewart Co., electrical machinery dealers, 604 First National Bank Building, Cincinnati, having been named by the court. The property of the company will be sold at auction.

The Reynolds Spring Co., Jackson, Mich., has declared a dividend of 1¾ per cent on preferred stock "A" payable July 1, to stockholders of record June 11; also a dividend of 1¾ per cent on preferred "B" stock.

The Ingersoll-Rand Co., reports net income for 1922 of $3,578,262 after interest, depreciation and taxes, compared with $582,241 in the preceding year. This was the equivalent after preferred dividends to $15.71 per share on common stock, against $3.95 in 1921. The balance sheet as of Sept. 31 last showed total assets of $39,953,492 against $36,585,640 the previous year. The profit and loss surplus stood at $6,525,727, compared with $17,308,429 the year before.

The Youngstown Sheet & Tube Co. has declared the quarterly dividend of $1.25 per share on common stock and $1.75 per share on preferred stock, both payable June 30.

Net income of the Westinghouse Electric & Mfg. Co. for the year ended March 31, 1923, was $13,263,485. Dividend requirements absorbed $6,033,428, so that more than $6,000,000 was added to the surplus. Gross sales for the year were $125,000,000, an increase of $25,000,000 over 1922. The cash position of the company is strong, current assets totaling more than $106,000,000 and current liabilities less than $17,000,000; value of unfilled orders at the close of the year was $61,914,237, as compared with $50,740,696 at the close of the previous year.

The Mid-West Steel & Supply Co., 744 Book Building, Detroit, has changed its name to the Mid-States Steel Co.

W. W. Croxton, freight traffic manager of the Atlanta, Birmingham & Atlantic Railroad for several years, has resigned and gone to Birmingham, Ala., where he has opened offices as general sales agent of the Garnsey Coal Co. and other producers.

P. R. Hoopes has opened offices at 252 Asylum Street, Hartford, Conn., as consulting mechanical engineer. He will specialize in the design of automatic and special machinery and in the development of inventions.

The Pittsburgh Valve, Foundry & Construction Co., Pittsburgh, has appointed R. J. Cooper as California representative with offices in the Monadnock Block, San Francisco. Robert M. Spurlock of Shreveport, La., has been appointed district sales representative in charge of the Louisiana territory. J. B. Purser, with headquarters at Charlotte, N. C., will have charge of sales in that territory, and the Burdick Pensinger Co., Kansas City, Mo., will represent the company in the adjacent territory.

A special meeting of the stockholders of the McMyler Interstate Co., Bedford, Ohio, has been called for June 26 to consider an increase of $250,000 in the company's preferred capital stock by issuing 2500 shares of 8 per cent cumulative stock, $1,500,000 in 7 per cent, first mortgage, sinking fund gold bonds, also 3000 shares of common stock. Redemption of the present outstanding preferred stock is planned.

The Steel & Tube Co. of America, Chicago, showed net earnings available for dividends for the first quarter of 1923 after interest charges, reserves for taxes, depreciation and depletion, of $2,207,415. This compares with a net of $472,420 for the entire year 1922.

The Hercules Steel Casting Co., Milwaukee, has been placed in the hands of a receiver by order of the Milwaukee County Circuit Court on petition of Walter D. Landwehr, vice-president, who states that the concern has assets of $350,000 and asked the receivership to avoid a multiplicity of suits by creditors. Emil B. Gennrich, formerly secretary-treasurer, recently filed suit to recover $4,997, claimed as unpaid salary and for commissions on capital stock sales. Edward L. Cullen, 2923 Cedar Street, Milwaukee, has been appointed receiver.

Judge F. A. Geiger of the United States District Court at Milwaukee has ruled that the Badger Metal Ware Co., Milwaukee, is insolvent and that the involuntary petition in bankruptcy filed recently is proper. The corporation sought a receivership in the State courts, claiming this action was being taken to avert insolvency. Following this proceeding, creditors instituted involuntary bankruptcy petition.

The balance sheet of the Hydraulic Steel Co. as of April 30, 1923, showed property account of $6,279,447, and total assets of $10,915,862. On the liabilities side there appeared a deficit of $1,415,911.

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Work will begin immediately on a new factory and repair shop for Henry Disston & Sons, Inc., on a site at Fourth Avenue, South and Massachusetts Street, Seattle, Wash. The company's West Coast headquarters are located in Seattle.

## PERSONAL

Harry C. Thomas, assistant general manager and recently elected a vice-president of the United Alloy Steel Corporation, went to Canton five years ago as general superintendent of the United Alloy plant. Mr. Thomas' experience includes twenty-three years of activity in the steel business, covering practically every phase of the industry. His career began in 1900 as a chemist for the Wheeling Steel & Iron Co., and subsequently he was connected in a chemical, metallurgical or operating executive capacity with the Alan Wood Iron & Steel Co. and with the United States Steel Corporation's plants at Braddock, Pa., Duquesne, Pa., Donora, Pa., Clairton, Pa., and Gary, Ind. Prior to his connection with United Alloy Steel Corporation, he was for ten years assistant general superintendent of the United States Steel Corporation's Gary plant.

HARRY C. THOMAS

H. H. Pleasance, who was elected a vice-president at the last annual meeting of the United Alloy Steel Corporation, began his sales career with the Standard Oil Co. of Cleveland. In 1903, being interested in steel products, he entered the employ of the Cambria Steel Co., at its Cleveland office and was associated with E. D. Rogers, who later went to Canton as general manager of sales for United Steel Co. After a short time in the Cleveland office, Mr. Pleasance was transferred to the larger territory in the Detroit district, which at that time embraced all of lower Michigan and northern Indiana. During this period, he spent a considerable time in the mills at Johnston, Pa., the experience gained there being of material assistance to him in building up his knowledge of alloy steels. Mr. Pleasance remained at Detroit with the Cambria Steel Co. until 1913, when he moved back to Cleveland in charge of sales for the United Steel Co. in territory now included in the Cleveland, Syracuse and Pittsburgh districts. He went to Canton with the United Alloy Steel Corporation in January, 1917, as assistant general manager of sales and was appointed general manager of sales on May 1, 1917.

H. H. PLEASANCE

Norman F. Brown, vice-president Dravo Contracting Co., Pittsburgh, has resigned, effective June 1, to engage in private practice as consulting engineer in Pittsburgh.

A. L. Humphrey, president Westinghouse Air Brake Co., Wilmerding, Pa., recently was elected president of the Pittsburgh Chamber of Commerce.

Dr. Richard B. Moore, chief chemist of the Department of the Interior, Bureau of Mines, has resigned, effective June 1. He will be succeeded by Dr. Samuel C. Lind, who has for several years acted as a superintendent of the rare and precious metals experiment station of the bureau at Reno, Nev. Dr. Moore will enter the commercial field with a well-known firm of consulting chemists and metallurgists in New York.

Elmer E. Finck, Buffalo, and A. G. Newell, Cleveland, have been elected secretary and director, respectively, of Waldo, Egbert & McLain, iron, coke and coal brokers, Buffalo. They are to take offices made vacant by the death of William J. McLain. Mr. Newell is also secretary of the Jefferson Coal Co., Cleveland. M. F. Selbert, of Buffalo, has been elected assistant secretary and Loring G. Calkins, of Boston, second vice-president. The directors are: John H. Bradley, Ward A. Wickwire, A. C. Newell, Fred J. Waldo and Justus Egbert. Fred J. Waldo, is president; Justus Egbert, vice-president and treasurer; Loring G. Calkins, second vice-president.

Roy Dimmitt, who has been state director of vocational education in Maryland since 1920, has resigned, effective July 1, to become dean of faculty and director of student activities at the Alabama Polytechnic Institute, Auburn, Ala.

Frank O. Hoagland, for several years general manager of the Reed-Prentice Co., Worcester, Mass., has resigned to accept an important place in the mechanical department of the Saco-Lowell Co., Boston, manufacturers of textile machinery. President J. Verner Critchley, of the Reed-Prentice Co., has assumed the additional office of general manager. Frederick W. McIntyre, general sales manager, becomes, in addition, assistant to the president. William T. Cowell, formerly assistant works manager of the Lodge & Shipley Machine Tool Co., Cincinnati, has been appointed works manager of the Reed-Prentice Co.

Edward C. Moore has been elected president of the Erie City Iron Works, Erie, Pa., to succeed Edward P. Selden, resigned.

Howard A. Knauss, Hokendauqua, Pa., for the past year superintendent at the local furnace of the Reading Iron Co., has resigned to become furnace superintendent of the Northern Iron Co., at Standish, N. Y.

Edward H. Temple, Jr., formerly construction manager of the Aberthaw Co., 27 School Street, Boston, industrial builder, becomes vice-president, and Grover C. Burrows, for several years manager of the Philadelphia office, becomes sales manager. Morton C. Tuttle has severed his connection with the company.

H. R. Sargent, formerly manager of the wiring supplies division of the Bridgeport Works, General Electric Co., has been appointed managing engineer of this division under a plan which will create several unit divisions at the Bridgeport plant.

D. B. Stokes, Western sales manager United States Cast Iron Pipe & Foundry Co., with headquarters at Chicago, has been appointed general sales manager with offices at Philadelphia, effective July 1. He succeeds N. F. S. Russell, recently elected president. W. G. Savage, Eastern sales manager, Philadelphia, succeeds Mr. Stokes at Chicago. C. E. Braun has been appointed assistant Western sales manager with office at Chicago. Mr. Stokes has been with the company continuously for 13 years, except for one year in the army as major in the construction division. He was consecutively Philadelphia sales agent, Eastern sales manager, and for the past four years, Western sales manager.

Park Hitchins, formerly Pittsburgh district manager of sales of the United States Refractories Corporation, Mount Union, Pa., has become identified with the General Refractories Co., and will be associated with R. A. MacDonald in the Cleveland office of that company. D. M. Thorpe, formerly in the Pittsburgh office of E. J. Lavino & Co., Philadelphia, in charge of refractories sales, has been named to succeed Mr. Hitchins with the United States Refractories Corporation.

James H. Johnston, who has been secretary-treasurer of the Taylor-Wilson Mfg. Co., McKees Rocks, Pa., has been elected president, succeeding the late H. M. Wilson. W. F. Taylor succeeds Mr. Johnston as secretary-treasurer of the company.

R. M. Sisk, vice-president and assistant treasurer of the Sharpsville Boiler Works Co., Sharpsville, Pa., recently severed his connection with the company. He has not yet announced his plans for the future.

C. P. Coffin, credit manager Illinois Steel Co. since 1902, by his request was retired from service June 1.

Prior to 1902, he was associated with interests which became part of the subsidiary companies of the United States Steel Corporation. In 1887 he was secretary and assistant treasurer of the Minnesota Iron Co. and retained that position until June 7, 1901, when the business of the Minnesota Iron Co. was taken over by the Oliver Iron Mining Co. For several years Mr. Coffin was president of the Chandler Iron Co. and treasurer of the Duluth & Iron Range Railroad. He was also president of the Lake Superior Consolidated Iron Mines. N. E. Crull, who for a number of years has been Mr. Coffin's assistant, will succeed Mr. Coffin as credit manager of the Illinois Steel Co. Prior to December, 1919, Mr. Crull was connected with the firm of Knapp & Campbell, general counsel for United States Steel Corporation interests at Chicago.

Earle F. Heffley has joined the sales department of the Betz-Pierce Co., Cleveland, jobber in steel. Several years ago he was connected with the Cambria Steel Co. and later with the Midvale Steel & Ordnance Co.

M. P. Simpson, vice-president in charge of purchases and one of the organizers of the Moltrop Steel Products Co., Beaver Falls, Pa., has sold his interest and retired from the company. His future plans are indefinite.

Harry G. Baldwin, originally with the New Departure Mfg. Co., Bristol, Conn., and subsequently, production manager of the S. K. F. Ball Bearing Co., Hartford, Conn., also later with H. G. Thompson Co., New Haven, Conn., has accepted a position with the Bristol company.

A. W. Kellogg has been transferred from the Boston office to the Philadelphia office of Read, Fears & Miller.

## BELGIAN STRIKE SERIOUS

### Stops Fuel Receipts from Ruhr—Price Decline Believed at End—Many Works May Suspend

BRUSSELS, BELGIUM, May 23.—The strike of the railroad workers is now the predominant factor in the Belgian industrial situation. Until the beginning of this week, it was hoped that the strike would soon end, and on Monday the number of passenger trains was increased. Unfortunately, the strike movement has become stronger again since Tuesday night, and there is an increasing belief that the policy followed by the national railwaymen's union aims at having work alternately resumed and stopped in order to unnerve the public and compel the Government to capitulate.

[This week's London cablegram says the strike is over.—EDITOR.]

However, the strike is far from popular as it is believed to be instigated from Berlin and it is felt that the intervention of British labor is only to defeat the energetic attitude of the Brussels Government toward Germany.

In the past few days no coke or coal from the Ruhr has arrived and 15,000 cars are blocked in Germany. Meanwhile, Belgian plants are running short of fuel and many are threatened with closing.

Few transactions are noted but the unexpressed or unsatisfied demand is accumulating and prices are more strongly held.

Blast furnaces and steel works, which, as a result of the railroad strike, are short of fuel, ore, limestone, etc., are closing and their products are dumped on the works' yards. If the strike continues another eight or 10 days nearly the entire Belgian metallurgical industry will be at a standstill.

Quotations are about as follows:

| | | |
|---|---|---|
| Pig Iron: | | |
| Basic, ordinary | 380 | $21.77 |
| Basic, special | 425 | 24.35 |
| Foundry, No. 1 | 460 | 25.22 |
| Foundry, No. 3 | 450 | 25.79 |
| Foundry, Luxemburg | 460 | 25.22 |
| Foundry, Lorraine | 460 | 25.22 |
| Ingots | 450 | 25.79 |
| Blooms | 500 | 28.65 |
| Billets | 550 | 31.52 |
| Steel bars, domestic | 625 | 35.81 |
| Steel bars, export | 580 | 33.23 |
| Beams, domestic | 600 to 615 | $34.38 to 35.24 |
| Beams, export | 575 to 585 | 32.95 to 33.52 |
| Rails, domestic | 650 | 37.25 |
| Rails, export | 550 | 31.52 |
| Wire rods | 800 | 45.84 |
| Wire, plain | 1,200 | 68.76 |
| Wire, galvanized | 1,300 to 1,350 | 74.49 to 77.35 |
| Wire, barbed | 1,400 to 1,450 | 80.22 to 83.08 |
| Nails | 1,250 | 71.63 |
| Sheets: | | |
| 5 mm. and heavier | 670 to 675 | 38.39 to 38.68 |
| 3 mm. | 725 | 41.54 |
| 2 mm. | 750 | 42.98 |
| 1.5 mm. | 800 | 45.84 |
| 1 mm. | 1,025 to 1,050 | 58.73 to 60.16 |
| 0.5 mm. | 1,150 | 65.89 |
| 1 mm., galvanized | 1,800 to 1,850 | 103.14 to 106.00 |
| 0.6 mm., galvanized | 2,000 | 114.60 |
| 0.3 mm., galvanized | 2,050 | 117.46 |

The distribution, with a provisional certificate, of Standard Sample No. 11c basic open-hearth 0.2 per cent carbon steel, was commenced during the past month by the Bureau of Standards.

## PROGRESS TOWARD SHORT DAY

### B. F. Jones, Jr., Predicts Disappearance of the Twelve-Hour Shift

Pittsburgh newspapers of June 5 publish the following statement by B. F. Jones, Jr., chairman of the board of directors of the Jones & Laughlin Steel Corporation, concerning the three-shift day in the steel industry, and in the same connection record Mr. Jones' agreement with the findings of the American Iron and Steel Institute committee:

"It is to be regretted that the impression prevails that the 12-hour day is still universal throughout the steel industry and that nothing toward its abolition has been accomplished, whereas, in fact, a great deal has been done.

"Originally, the industry was generally upon a 12-hour basis. Today much of the work is being done on shorter turns. Our observation is that the rate of progress toward abolition of the 12-hour day indicates that its complete disappearance is only a matter of time, if the present process of elimination is allowed to proceed naturally and in an orderly manner. Abrupt changes in established practices are fraught with danger to all parties.

"We have been studying and working to eliminate the 12-hour day for more than 25 years. We have made many experiments with projects for its complete elimination, some of which have proved measurably successful. Others have been complete failures. But the total result has been the reduction of the number of men in our manufacturing processes who work over 10 hours by more than 50 per cent since 1910. This rate of reduction indicates that the long turns will be self-eliminated in due course, the exact time depending naturally upon all the factors entering into an economic change of this magnitude. If in the meantime a practicable plan for abolition of the long turn can be worked out by the industry and be applied without severe economic disturbance, we shall be happy to participate with the rest in its adoption."

### To Sell Thomas Iron

E. Arthur Tutein, Inc., Boston, New York and Philadelphia, has been appointed exclusive selling agent for Thomas pig iron, and books have been opened for third quarter business. This company sold Thomas iron for several years before the recent taking over of the Thomas properties by the Reading Iron Co.

The new freighter, Frontenac, of the Cleveland Cliffs Iron Co., was launched at the Great Lakes Engineering Works yards, Ecorse, Mich., Saturday, May 26. Miss Esther Schneider, daughter of A. E. R. Schneider, christened the new boat. The Frontenac, 610 ft long, with a beam of 66 ft., has a capacity of 12,000 tons, and will be used for the carrying of bulk lake freight.

## Plans of New Companies

The T. M. Grindley Co., 1158 Homer Street, Vancouver, B. C., recently organized, will handle the sales of the Conveyors Corporation of America, Chicago, in the province of British Columbia. The Grindley company was the western office of Gormans Ltd., Edmonton, and operated under that name up to May 1, when Mr. Grindley took over the business.

The Rubberstone Flooring Corporation, 1400 Broadway, New York has been incorporated with capital stock of $50,000 to manufacture composition flooring. It has acquired a portion of the business of the E. H. Stone Co. and has a factory at Berkley Heights, N. J. E. G. Hannam and E. H. Stone head the company.

The Globe Automatic Sprinkler Co. of the United States has been organized to take over the property and other assets of the company by the same name organized in Pennsylvania 18 years ago. Merrill, Lynch & Co., New York, bankers, have offered to public subscription 40,000 shares of no par value cumulative stock of the new company at $48.50 per share.

The Elk Machine Tool Corporation, care of Lurie & Feinberg, 38 Park Row, New York, has been incorporated with capital stock of $112,000 to manufacture tools and parts. Present activities are given to organization matters, hence no plans for manufacturing have been taken up as yet. Incorporators are J. G. Elkin and H. I. Lurie.

The Spring Makers & Metal Stampers Corporation of America, recently incorporated with capital stock of $50,000, has secured headquarters at 161 Grand Street and is now in production. The company will specialize in manufacturing springs.

The Stewart Terminals, Ltd., Montreal, Canada, has been incorporated and will build a million-dollar grain elevator at Port Arthur. James Stewart, president of the company, also president of the Maple Leaf Milling Co., is a prominent grain authority and a director of the Bank of Montreal. The plant is fitted to provide for an initial capacity of 1,500,000 bushels. Part of the financing has been done through the sale of $550,000 6½ per cent first mortgage serial gold bonds.

The Wallace-Lispenard Cotton Harvester Co., New York, was recently incorporated with capital stock of $150,000 to manufacture cotton machinery and expects to be ready for production by fall but has made no definite plans for manufacturing. The officials expect to locate in the vicinity of Pittsburgh. George Lispenard, 210 Canal Street, New York, is chief engineer, and he and H. M. Wise, are the incorporators. Present address is care of Lee, Smyth, Aron & Wise, 7 Dey Street, New York.

The Goshen Stamping & Tool Co., Jackson and Ninth Streets, Goshen, Ind., recently organized, is manufacturing machinery, tools, dies, jigs, and rubber goods molds. It has an up-to-date machine shop equipped to make all kinds of tools and metal specialties. The company will move into larger quarters next month. H. M. Hostetler is treasurer.

The Steel Wheel Corporation, Mt. Elliott Avenue, Detroit, has been incorporated with capital stock of $10,000 and 100,000 shares no par value stock to license the manufacture and sale of steel wheels under the Putnam, Forsyth, Williams and Winter patents. Such licenses will be granted to manufacturers. The Wheel corporation will not do any manufacturing under its own name. Stock is held by the Steel Wheel Corporation, Detroit Pressed Steel Co., and the American Steel Foundries Co. of Chicago. C. H. L. Flintermann, vice-president, Detroit Pressed Steel Co., and formerly vice-president of the Disteel Wheel Corporation, is president; B. S. Gier, secretary-treasurer Motor Wheel Corporation, is secretary-treasurer, and H. F. Harper, president Motor Wheel Corporation is vice-president.

Joseph W. Hayes & Associates have been organized as consulting combustion engineers with headquarters at Michigan City, Ind. The company will be able to render consulting service to steam plants in all parts of the country. Each member has had wide experience in this line and will look after the engineering work in his immediate territory.

The Citizens Auto Parts Co., Fifth and Hamilton Avenues, Dayton, Ohio, recently organized to manufacture automotive accessories, will confine its present activities to handling replacement parts, new and used, for automobiles. J. J. Jacobs heads the company.

The Coatesville Plate Washer Co., Coatesville, Pa., has been incorporated under Delaware laws to manufacture metal plate products and mechanical equipment. Its principal products are steel plate washers. The company has a completely equipped shop and is now in production. W. T. Stophel is manager.

The Steelcraft Parts Co. has been organized to manufacture tools and other mechanical equipment. It has taken over the plant and equipment formerly belonging to the Structural Tool Co., Cleveland. Its plans for manufacturing are unknown. Address care Frank T. Cullitan, 1035 Guardian Building, Cleveland.

Marine Engine & Repair Co., Inc., Warwick Avenue and Eighth Street, Newport News, Va., has been incorporated to build and repair boats and engines and to operate a general woodworking and machine shop. It is prepared to do all kinds of marine work, having an up-to-date plant. The company is now operative. H. G. Smith heads the company.

The Lehigh Fan Co., Allentown, Pa., has been incorporated for the purpose of taking over the fan manufacturing department of Hersh Brothers Co., Allentown. The company has a plant and sufficient equipment for present needs.

The Standard Piston Co., Detroit, recently organized to manufacture automobile engine pistons and kindred mechanical products, states that for the present it will act as distributor for pistons manufactured by the McLouth Industries of Marine City, Mich. However, the company is prepared to do cylinder grinding and piston fitting. It will also supply special tools for cars, most of which will be manufactured in its own shop. Cameron B. Waterman, 330 Lincoln Road, Gross Point, Mich., heads the company.

The Truss Brake Corporation, Buffalo, has been incorporated with capital stock of $75,000 to manufacture brakes and equipment. Its plans are unknown. The incorporators are M. C. Weber, C. N. Andrews and G. T. Ballachy. Address care Botsford, Lytle, Mitchell & Albro, 925 Fidelity Building, Buffalo.

The Molded Products Co., Hartford, Conn., has been incorporated with capital stock of $50,000, to manufacture molded and composition products. It will not be in a position to start active business for at least six months. Address care Harrison B. Freeman, First National Bank Building, Hartford.

The National Windsor Motor Stabilizer Corporation, 26 West Fifty-eighth Street, New York, recently incorporated with capital stock of $310,000, to manufacture automotive equipment, will manufacture a support for Ford motors. Manufacturing for the present will be done under contract by the Deep Drawn Metal Co., Brooklyn. The company's Brooklyn branch is located at 46 Fulton Street. Initial capacity is estimated at 3000 stabilizers per week. J. K. Hollins is president and Charles Lawrence, vice-president Wright-Martin Airplane Co. is vice-president.

The Ashmead-Danks Co., Cleveland, has been incorporated to engage in the sale and installation of power plant equipment and has opened offices at 7016 Euclid Avenue. A. C. Danks is president, C. B. Ashmead, vice-president and treasurer, and Winfield Worline is secretary. The company is representing the Tracy Engineering Co., maker of steam purifiers, the Bacharach Industrial Instrument Co., C. Lee Cook Mfg. Co., maker of metallic packing, and the E. A. Wilcox Mfg. Co., gasket manufacturer. Mr. Danks was formerly superintendent of steam and water at the Edgar Thomson Works of the Carnegie Steel Co., Braddock, Pa. Mr. Ashmead for the past ten years has represented the Richardson-Phenix Co., Milwaukee, lubrication engineer and manufacturer, as direct manager of its Pittsburgh offices. Both Mr. Danks and Mr. Ashmead are members of the American Society of Mechanical Engineers, Association of Iron and Steel Electrical Engineers, the Cleveland Engineering Society, and Engineers' Society of Western Pennsylvania.

The Belton Cotton Mill Co., Summerville, Ga., has been organized with capital stock of $200,000, and will begin work at once on a factory. It will also erect 50 houses for employees.

The Loom Power Adjuster Co., care of W. H. Johnston, 1413 South Fifty-eighth Street, Philadelphia, has been incorporated to manufacture textile machine equipment. The company's plant is located at 723 North Twenty-fourth Street, but manufacturing for the present is being done under contract. Its main product is a roller bearing power adjuster.

The E. J. Bennett Castings Co., Superior Building, Cleveland, recently incorporated with capital stock of $50,000, announces that it has arranged to handle the sales of three gray iron foundries. E. J. Bennett, who is at the head of the company, was formerly vice-president of the Sibley Machine Co., South Bend, Ind.

Plans are complete, contingent upon the decision of Dorris stockholders, to merge the Winton Co., Cleveland; Haynes Motor Co., Kokomo, Ind., and the Dorris Motor Co., St. Louis, into the Consolidated Motors Corporation, capitalized at $19,000,000, and accordingly Winton liabilities will be cleared through the merger, it is understood.

The Detroit Motor Body Corporation has been incorporated with capital stock of $100,000 preferred and

800,000 shares of no par common stock, to manufacture car bodies. The company expects to be in production within four months. William B. Hurlburt, formerly president of the Hurlburt Motor Truck Co., is president. Walter Thompson is general manager in charge of production.

The Beaux-Arts Wrought Iron Co., Greenwich Street, New York, has been incorporated with capital stock of $20,000 to manufacture ornamental iron products. It is now operative on a small scale. Corporate representatives are Lind, Pfeiffer & Crames, 347 Fifth Avenue.

The Whiteland Radio Co., Sixth and Washington Streets, Long Island City, has been incorporated with capital stock of $50,000 to manufacture wireless equipment and parts. It is now doing business on a limited scale. Address care of J. L. Spence, 383 Madison Avenue, New York.

The Erickson Suspension Wheel Corporation, 277 Broadway, New York, has been incorporated with capital stock of $2,000,000 to manufacture automobile wheels and equipment. Its principal product is a disk wheel, the peripheral sections for which are made of aluminum alloy. Plans for the future are not definitely decided, but a plant is being sought somewhere in the vicinity of New York for assembling. Manufacturing is to be done under contract, it is expected. The incorporators are M. Erickson, James A. Koehl and E. P. Nelson.

The Morrell Specialties Co., New York, has been incorporated with capital stock of $25,000 to manufacture machinery and parts. Its management is identified with the John Gilbert Co., 173 Crosby Street, but beyond this its plans are unknown. The incorporators are J. Marks, M. Morrell and J. Gilbert.

The National Windsor Motor Stabilizer Corporation, 26 West Fifty-eighth Street, New York, recently incorporated with capital stock of $310,000, will manufacture apparatus for securing the motor in Ford cars. It is understood that the product is already in large demand and it is likely that assembling plants will be located in several large centers.

The Purvis Machine Co. with factory at College Point, L. I., has been incorporated with capital stock of $200,000, to manufacture machinery and parts. It has a new shop of about 40,000 sq. ft., completely equipped. The company manufactures special parts, tools, machinery, and also does repair work. The incorporators are W. T. Simpson, G. R. Brennan and A. C. Flamman.

The Trippensee Closed Body Corporation has been organized as a consolidation of the Trippensee Mfg. Co., Twelfth Street and Stanley Avenue, Detroit, and Everitt Brothers. The new company will manufacture complete automobile bodies. William F. Trippensee is president; A. W. Trippensee, vice-president, and F. J. Trippensee, secretary-treasurer.

The Aerofin Corporation, recently organized to manufacture iron and steel products, is having its work for the present done by the Carrier Construction Co., Inc., sheet metal workers and machinists, 750 Frelinghuysen Avenue, Newark, N. J. M. S. Smith is secretary of the latter company.

## Plans of Detroit Steel Products Co.

The Detroit Steel Products Co., Detroit, manufacturer of Fenestra steel sash and Detroit automobile springs, will establish a branch factory at Emeryville, near Oakland, Cal., due to increase in its business on the Pacific Coast and in the Orient. V. F. Dewey, president of the company, announced last week that it plans the erection of a completely equipped plant for the manufacture of its products. The first unit is already under construction and is expected to be in production by June 15. It is being built under the direction of Harry Wathen, formerly of Detroit, who is in charge of steel sash erection in the coast district for the Fenestra Construction Co., a subsidiary of the Detroit Steel Products Co. This unit will be used for the complete manufacture and assembly of steel sash.

The site of the plant, which comprises 83,000 sq. ft., provides ample facilities for shipment by rail and water. Burleigh A. Lum has been appointed manager of sales of the Pacific Coast and will maintain his office in the present offices of the company at 251 Kearney Street, San Francisco. Mr. Lum was previously Western district manager for the company, with offices in Kansas City.

Officers of the company are: J. G. Rumney, chairman of the board; V. F. Dewey, president; M. P. Rumney and H. F. Wardwell, vice-presidents, and E. R. Ailes, secretary and treasurer. The company is capitalized at $3,500,000 and have been doing a gross business of $10,000,000 a year.

## Trade Changes

The Majestic Mfg. Co., malleable and charcoal iron ranges and heaters, 2134 Morgan Street, St. Louis, has effected a reorganization upon the death of the former president, R. H. Stockton. Frank R. Henry has been elected president, Carl E. Sommer, vice-president and secretary, and A. A. Phillips, treasurer.

The Columbia Steel & Shafting Co., Pittsburgh, has purchased the entire stock of shafting and machinery of the Brightman Mfg. Co., Columbus, Ohio, for manufacturing the same. Inquiries for shafting and cold finished steel bars should be addressed to the former company.

The Gibb Instrument Co., Bay City, Mich., electric welding eqipment, has been appointed distributer of the General Electric Co.'s arc welding electrodes in the Middle West.

The Poldi Steel Corporation of America announces the removal of offices and warehouse on June 1 to 151 Bank Street, New York.

The Hudson City Steel Corporation, Woolworth Building, New York, has moved its offices to 2 Rector Street.

Offices of the United States Iron & Steel Co., Woolworth, Building, New York, have been moved to 2 Rector Street.

Following the sale of the plant on June 6, a reorganization of the C. H. Wills Automobile Co., Marysville, Mich., will be taken up involving a new management, but retaining a majority of the personnel.

Under a reorganization plan the Railway Roller Bearing Co., Syracuse, N. Y., has changed its name to the Rollway Bearing Co., Inc.

The Wright Aeronautical Corporation has acquired the assets and business of the Lawrence Aero Engine Corporation, manufacturer of Lawrence air-cooled motors. Charles L. Lawrence becomes vice-president of the Wright Corporation.

Westinghouse Electric & Mfg. Co. officials announce that the plant at Sharon, Pa., acquired from the Savage Arms Corporation, will be used for manufacturing transformers. Operations will start next October with 1000 employees. When the plant is running at capacity about 3000 will be given employment. The East Pittsburgh transformer division is being transferred to Sharon. C. H. Champlain has been named works manager.

The Webster Mfg. Co., Chicago, announces the appointment of Robert T. Pierce as manager of the New York sales office, 90 West Street. He succeeds the late Glen N. Porter, whose death occurred last March.

The Moltrup Steel Products Co., Beaver Falls, Pa., has opened a district sales office in Buffalo, at 303 White Building, in charge of Charles T. Neale.

The Chas. A. Strelinger Co., Detroit, has been appointed exclusive Agent for the J. N. La Pointe Co., broaches and broaching machines, New London, Conn. in Michigan.

William Jessop & Sons, Inc., have opened a sales office and warehouse for tool steel at 1277 West Ninth Street., Cleveland. V. M. Wellman has been placed in charge.

The Whitman & Barnes Mfg. Co., twist drills and reamers, has moved its New York office and store to 99 Chambers Street.

Herbert W. Hayes, formerly New England manager of sales for the Midvale-Cambria Co., Boston, has established an office at 40 Court Street, Room 1003, that city, for the sale of steel products.

The Ray Battery Co., Ypsilanti, Mich., has been purchased by Arthur Jordan, Indianapolis, owner of the Detroit Battery Co., and the Disco Electric Mfg. Co., Detroit. The Detroit Battery Co. will become affiliated with the Ray company and the merged concerns will be known as the Arthur Jordan Battery Co., Ypsilanti, under the management of T. H. Lavier, inventor of the Ray battery.

The Motor Wheel Corporation, Lansing, Mich., has purchased the spoke and rim stock mill at Fordyce, Ark., which will be a feeder to its mills at Memphis, Tenn., and the third unit of its Southern plants. The new property has from 850,000,000 to 1,000,000,000 ft. of hickory timber available. The company's present production is 75,000,000 spokes per year.

The Milwaukee office of the Kalman Steel Co. has been moved from 1205 First Wisconsin National Bank building to 727 Merchants & Manufacturers Bank Building, 216 West Water Street.

The St. Louis Coke & Chemical Co. will be known as the St. Louis Coke & Iron Co. under a reorganization plan announced April 11, which provides for scaling down the old 8 per cent 20-year bonds to 6 per cent.

# Machinery Markets and News of the Works

## RAILROAD INQUIRY ACTIVE

### Several Large Lists Are Now Pending and Buying Is Expected Soon

### Norfolk & Western Asks for Prices on Nearly 50 Items—Toledo Board of Education May Buy 23 Machines

Fairly heavy buying of machine tools by the railroads is in prospect and it is expected that orders will come in time to swell June sales records. In addition to several lists that have been pending for some weeks, there is a new list from the Chicago, Burlington & Quincy consisting of 93 machines and one from the Norfolk & Western involving nearly 50 items. Among the inquiries not acted upon are those of the Elgin, Joliet & Eastern, Denver & Rio Grande Western, Santa Fe, Pere Marquette and Rock Island Lines. The volume of railroad business now pending is the largest within the memory of the machine-tool trade.

There has also been fairly good buying by the railroads within the past week. The Union Pacific has closed for the remainder of its list for its main line, but has not taken action on the tools for its subsidiary roads. Its purchases amounted to more than $90,000. Numbers of other roads have also bought, but their purchases have been confined to a few tools each. The Michigan Central bought several tools.

Inquiry from industrial companies is smaller than that of a month or so ago, but there is a fair amount of buying, usually of single tools. The Toledo Board of Education has issued an inquiry for 23 machines for a high school vocational training department. A peculiar provision of the inquiry is that not more than two lathes of any one make shall be purchased, there being 11 lathes on the list.

In view of the large volume of prospective railroad buying, the outlook for June is considered fairly good.

## New York

NEW YORK, June 5.

THE Norfolk & Western Railroad has inquired for nearly 50 machines, bids having been closed June 4. The Atlantic Coast Line has an inquiry out for three machines. The railroads are furnishing most of the important activity in machine tools. Orders from industrial companies are in fair volume in the aggregate, but consist mostly of single tools. The Baldwin Locomotive Works, Philadelphia, has ordered four 50-in. vertical milling machines. The recent purchases of the Central Railroad of New Jersey included a 6-ft. radial and two 4-ft. radial drills. The United Engineering & Foundry Co., Pittsburgh, has bought a 36-in. x 24-ft. lathe. An order has been received in the East from the Hallidie Machinery Co., Seattle, Wash., for a 53-in. boring mill.

The inquiry of the Norfolk & Western includes the following items:

Two 3¼ x 36-in. turret lathes.
Two 2½ x 30-in. flat turret lathes.
One 9-in. cold cut-off saw.
Three 48-in. double-end punch and shear.
One standard double-head, center-drive car axle lathe.
One 25-in. engine lathe, 6 ft. between centers.
One 24-in., 4-jaw, combination lathe chuck.
Two 60-in. radial drills.
Two 18-in. x 3-in. double floor grinders.
One 40-in. rip saw.
One 42-in. vertical boring mill.
Two 16-in. geared-head engine lathes, 4 ft. between centers.
Two 16-in., 4-jaw combination chucks.
One power forcing press, 50-ton capacity.
One 5-spindle car shop wood borer.
One revolving oil stone grinder.
Two 4-spindle automatic machines for finishing pins and bushings up to 2 in. diameter.
Two 4-spindle automatic machines for finishing pins and bushings between 2 and 4 in. diameter.
One 500-lb. pneumatic jar molding machine.
One 900-lb. pneumatic jar molding machine.
One 600-lb. single-frame steam hammer.
Two 20-in. geared-head engine lathes, 5 ft. between centers.
Two 18-in., 4-jaw, combination chucks.
Two cross compound air compressors, capacity 500 ft. per min.
One ⅜ to 2 in. pipe threader and cutter.
One 2½-in. double-head bolt threader.
One 72-in. plain radial drill.
One 24-in. geared-head engine lathe, 7 ft. between centers.
One 24-in., 4-jaw, combination chuck.
One 36-in. crank shaper.
One 48-in. geared-head, engine lathe, 10 ft. between centers.
One 72-in. vertical boring mill.
One Nazel air hammer.

The Atlantic Coast Line is in the market for the following machines:

One 4000-lb. steam hammer.
One Hilles & Jones alligator shear, capacity ¾ in.
One Ajax upsetting and forging machine.

F. H. Crawford & Co., 299 Broadway, New York, are in the market for a 200-ton to 300-ton hydraulic press, complete with motor-driven pump, suitable for 230 volts d.c. The requirement between columns is 48 in. with 36 in. daylight under ram.

C. Sautter, 14 Genesee Street, Utica, N. Y., will take bids in about two weeks for a two-story machine shop to cost $50,000 with equipment. T. H. Williams, Devereau Block, is architect.

The New York Dock Co., 44 Whitehall Street, New York, has plans for extensions and improvements in its repair shops and plant at 23-25 Congress Street, Brooklyn, to cost $85,000.

The Manning Abrasive Co., Troy, N. Y., operating a plant at Watervliet, N. Y., is planning the erection of a new factory at Green Island, to cost about $180,000 including machinery.

Bids will be received by the Superintendent of Lighthouses, Staten Island, N. Y., until June 18, for steel bodies for acetylene buoys, proposal 14,925.

The Frederick Pearce Co., New York, machinist, has removed its plant from Rose Street to 410-16 East Thirty-second Street, where additional equipment will be provided for larger production.

Manual training equipment will be installed in the two-story addition to be erected at the high school, New York Mills, N. Y., estimated to cost $70,000, for which bids will be called on a general contract this month. Kinne & Frank, Mayro Building, Utica, N. Y., are architects.

Ovens, power equipment, conveying machinery, etc., will be installed in the new four-story plant, 78 x 115 ft., with one-story extension, 50 x 80 ft., to be established by the Great Atlantic & Pacific Tea Co., 150 Bay Street, Jersey City, N. J., on site in the Bronx, New York, to cost close to $100,000.

The American Can Co., 120 Broadway, New York, will commence the construction of two reinforced-concrete additions to its plant at Third and Twentieth Streets, San Francisco, comprising a two-story structure, 200 x 225 ft., and three-story building, 80 x 180 ft., estimated to cost about $1,000,000, including machinery. Work has also been started on a new four-story factory at Honolulu, to cost approximately $750,000 with equipment.

## The Crane Market

Few new inquiries for either electric overhead or locomotive cranes have appeared in the past week, prospective buyers in many instances having adopted the attitude that in view of the decline in the materials market, by delaying they may be able to purchase equipment at slightly lower prices. A fairly large volume of inquiry is still current, however, and a number of awards are reported, both in electric overhead and locomotive cranes. The expected list of 30 small capacity cranes for an ice plant in Cuba, reported last week, has not yet developed sufficiently for an inquiry to be issued. Among the pending orders for locomotive cranes are those for the Central Railroad of New Jersey and the two large capacity cranes for handling coal, asked for by the Atlas-Portland Cement Co., 25 Broadway, New York, for its plant at Hudson, N. Y. The five locomotive cranes on the list of the New York Central & Hudson River Railroad, are said to have been awarded. Lockwood-Greene & Co., Boston, Mass., are reported to be asking for prices on a list of small cranes for Jenkins Brothers' plant at Bridgeport, Conn. Joseph T. Ryerson & Son, Chicago, have been receiving bids on a 10-ton electric traveling crane for their Jersey City, N. J., warehouse and are also in the market for two 10-ton electric cranes for their Detroit, Mich., warehouse. A Pittsburgh district railroad car builder recently purchased three 1-ton electric hoists from the Northern Engineering Works.

Among recent purchases are:

American Locomotive Co., 30 Church Street, New York, a 10-ton overhead traveling crane and two 5-ton, single-leg gantry cranes for Chester, Pa., and a 10-ton and a 15-ton overhead traveling crane and a 10-ton trolley for Schenectady, N. Y., from the Shaw Electric Crane Co.

American Car & Foundry Co., 165 Broadway, New York, a 15-ton, 60-ft. span double trolley electric traveling crane for St. Louis, Mo., from the Champion Engineering Co., and a 3-ton electric crane from the Northern Engineering Works.

Southern Pacific Co., 120 Broadway, New York, a 20-ton, 40-ft. span, 3-motor crane for the San Jose shops in California from the Whiting Corporation and a 40-ton, 45-ft. span crane reported to have been awarded to the Niles-Bement-Pond Co.

Stone & Webster, Boston, Mass., a 20-ton, 42-ft. span overhead traveling crane, for the Paducah Electric Co., Paducah, Ky., from the Whiting Corporation.

McMurtrie-Guiler Co., sugar merchants, 82 Beaver Street, New York, a 15-ton electric trolley for use in Porto Rico, P. I., from the Whiting Corporation.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., a 1-ton, 15-ft. span, 3-motor, single I-beam crane for East Norwood, Ohio, from the Shepard Electric Crane & Hoist Co.

Humphrey & Sons Co., Joliet, Ill., a 2-ton, 16-ft. span, single I-beam crane from the Shepard Electric Crane & Hoist Co.

Jones & Laughlin Steel Corporation, Pittsburgh, two 5-ton, single I-beam, electric hoists from the Shepard Electric Crane & Hoist Co.

Morrow Mfg. Co., Wellston, Ohio, four 1-ton electric hoists from the Shepard Electric Crane & Hoist Co.

Simmons Machine Co., Albany, N. Y., a used 15-ton Niles-Bement-Pond overhead traveling crane from a company at Bethlehem, Pa.

Morris County Crushed Stone Co., Morristown, N. J., three 25-ton locomotive cranes from the Browning Co.

Crucible Steel Co. of America, 17 East Forty-second Street, New York, a 20-ton locomotive crane for the Halcomb Steel Co., Syracuse, N. Y., from the Browning Co.

Small & Costello, coal dealers, foot of West Fifty-first Street, New York, a used 15-ton, Browning locomotive crane from the Hoisting Machinery Co., New York.

Pere Marquette Railroad, Detroit, Mich., a 5-ton, 50-ft. span, 3-motor, bucket crane for handling cinders and coal, from the Northern Engineering Works.

Inland Steel Co., Chicago, four spout hoist jib cranes for use at open-hearth furnaces, from the Whiting Corporation.

Chicago, Burlington & Quincy Railroad, 54 small capacity jib cranes with trolleys and miscellaneous material for its Denver, Colo., shops, from H. D. Conkey & Co.

Indianapolis Sewage Commission, Indianapolic, Ind., a 5-ton, 40-ft. span, 2-motor, floor control, overhead traveling crane from H. D. Conkey & Co.

Greenville Steel Car Co., Greenville, Pa., a 10-ton, 69-ft. 10-in. span, electric traveling crane, from the Cleveland Crane & Engineering Co.

Orona Pulp & Paper Co., Orona, Me., a 15-ton, 22-ft. span, electric traveling crane, from the Cleveland Crane & Engineering Co.

American Steel & Wire Co., Cleveland, Ohio, a 10-ton, 75-ft. span, electric traveling crane for its hp. works, from the Cleveland Crane & Engineering Co.

Keystone Bronze Co., Pittsburgh, a 5-ton trolley from the Northern Engineering Works.

Hubbard & Co., Pittsburgh, a 3-ton, double-hook, 3-motor, overhead traveling crane, from the Northern Engineering Works.

Pittsburgh Spring & Steel Co., Pittsburgh, a 5-ton overhead traveling crane, from the Shaw Electric Crane Co.

J. C. Smith Cut Stone Co., Detroit, Mich., a 2-ton, 25-ft. span, electric traveling crane from the Northern Engineering Works.

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The Ort Steel Co., 313 East Twenty-second Street, New York, is inquiring for a spot welder.

The Powers Accounting Machine Corporation, 115 Broadway, New York, recently affiliated with the Wales Adding Machine Co., Wilkes-Barre, Pa., has leased a one-story factory, 80 x 400 ft., on Codwise Avenue, New Brunswick, N. J., for a new plant, with option to purchase. The company will remove its works at 1401 Thirty-seventh Street, Brooklyn, and increase the facilities for the manufacture of assorting, punching and tabulating machines and parts.

The Certain-teed Products Corporation, 233 Broadway, New York, manufacturer of roofing etc., has taken over the plant of the Acme Cement Plaster Co., Acme, near Quanah, Tex., recently purchased, and has plans for additions and the installation of new power and other machinery.

The Federal Mining & Smelting Co., 120 Broadway, New York, is planning the installation of new concentrating and electric power equipment at its properties at Smithers, B. C.

The Foundation Co., 120 Liberty Street, New York, has closed a contract with the Illinois Central Light & Power Co., Peoria, Ill., for a new plant to cost in excess of $500,000 to be located at Peoria.

A manual training department will be installed in the three-story high school to be erected on Greenbrook Road, North Plainfield, N. J., estimated to cost $300,000 for which plans have been completed by John T. Simpson, 31 Clinton Street, Newark, architect.

The Oxford Foundry & Machine Co., Oxford, N. J., is considering the rebuilding of the portion of its plant destroyed by fire May 26, with loss approximating $30,000 including equipment.

Power equipment, conveying machinery and other transmission equipment will be installed in the new two-story addition, 50 x 300 ft., to be built by the Robert Griffin Co., 151 West Side Avenue, Jersey City, N. J., manufacturer of wall paper, estimated to cost $100,000 with equipment. Christian H. Ziegler, 75 Montgomery Street, is architect.

The Willard Co., 309 Harrison Avenue, Harrison, N. J., recently organized with a capital of $100,000, is planning for the establishment of a metal-working and retinning plant. Samuel H. Clark and Clarence T. Van Deren head the company.

The plant and property of the National Chain Co., Terry Street, Belleville, N. J., has been acquired by Andrew Boylan and associates at a receiver's sale. The new owners plan to reorganize the company and operate the plant.

Salz Brothers, 21 Hackett Street, Newark, manufacturer of fountain pens, etc., has leased a portion of the building at 41-49 Commercial Street, for a new plant.

A manual training department will be installed in the new two-story high school to be erected at Bogota, N. J., estimated to cost $200,000, for which bids have been called on a general contract. Guilbert & Betelle, Chamber of Commerce Building, Newark, are consulting architects.

Jacob Redlinghouse, Newark, operating a foundry at 74 Garden Street for the manufacture of iron and other metal castings, has organized a new company, Jacob Redlinghouse, Inc., capitalized at $100,000, to take over and expand the present business. Herman Roemer will also be an official of the new organization.

The Standard Motor Trading Co., Keyport, N. J., plans the installation of a machine shop in the new one-story service building, 170 x 195 ft., to be erected on local site, estimated to cost $80,000. J. S. Crane, 41 Park Row, New York, is consulting engineer.

The Farrell Auto Co., 1125 Atlantic Avenue, Brooklyn, has leased the building at 325 St. Marks Avenue, for a new machine shop and service works. Equipment will be installed at once.

## Philadelphia

PHILADELPHIA, June 4.

A BUILDING permit has been taken out by the Energy Elevator Co., 214 New Street, Philadelphia, manufacturer of freight elevators, etc., for a one-story addition to cost about $15,000, exclusive of equipment, for which a contract recently was let to Clayton Lofland, 229-31 North Water Street.

Fire, May 26, destroyed a portion of the repair shop and service works of the St. Martin's Coal Co., 7600 Germantown Avenue, Philadelphia, on the Welsh Road, with loss estimated at $27,000. It is planned to rebuild.

Plans have been filed by the Atwater Kent Mfg. Co., 4937 Stenton Avenue, Philadelphia, manufacturer of radio equipment and other electrical products, for the erection of the initial unit of its plant on property recently acquired at Wissahickon and Abbotsford Avenues, estimated to cost $155,000, with equipment.

The Atlantic Refining Co., 3144 Passyunk Avenue, Philadelphia, has plans for a new one-story steam power house and pumping plant at Passyunk Avenue and the Schuylkill River.

The Leather Products Co., 1150 Adams Street, Frankford, Philadelphia, manufacturer of mechanical belting, has leased a factory at Wayne Junction and will remove to this location. Additional power and transmission machinery will be installed. A. S. Hull is president.

The Trenton Flint & Spar Co., Marian Street, Trenton, N. J., will commence the erection of an addition to its plant, for which a general contract has been awarded to J. P. Barlow, Trenton. Grinding, pulverizing and other machinery will be installed.

The Public Service Electric Co., Trenton, will build a new power substation with capacity of 4500 kva., for service at the plant of the John A. Roebling's Sons Co., manufacturer of steel and wire goods, Roebling, near Trenton. The Roebling company will discontinue operations at its individual power plant.

The Board of County Freeholders, Trenton, N. J., is considering the installation of additional crushing machinery, transmission equipment and other apparatus at the County quarry at Moore's Station, to increase the capacity from 150 to 400 tons per day. It is estimated to cost about $40,000.

The Forged Steel Products Co., Newport, Pa., has acquired the former textile mill of the H. A. Romberger Mfg. Co., and will remodel the structure for a new plant.

A manual training department will be installed in the new junior high school to be erected at Neffsville, Pa., estimated to cost $115,000. Henry Y. Shaub, Imperial Building, Lancaster, Pa., is architect.

The Glen Alden Coal Co., West Pittston, Pa., will commence the construction of a one-story power house, 85 x 90 ft., with extension, 32 x 70 ft., at its Pettebone Colliery, Kingston, Pa.

The Seiberling Rubber Co., New Castle, Pa., is planning for extensions to increase the capacity from 800 to 3000 cord tires per day. Additional electric power equipment will be installed.

Fire, May 20, destroyed the No. 3 coal breaker of Pardee Brothers & Co., Inc., Hazleton, Pa., with loss estimated at $50,000, including equipment. Headquarters are in the Widener Building, Philadelphia.

The Eagle Paper Mill, Freeland, Pa., has been acquired by new interests, which will remodel and improve the plant. Additional machinery will be installed, including electric power equipment.

The American Air Stand Mfg. Co., Jersey Shore, Pa., has acquired property fronting on the New York Central Railroad and will soon break ground for the erection of the first unit of a new plant to manufacture pumping and other mechanical equipment.

The Waynesboro Nut Lock Co., Waynesboro, Pa., recently organized with a capital of $100,000, will take over the factory and business of the Bull Dog Lock Co., Baltimore. Plans are under way for the establishment of a new plant at Waynesboro, and the Baltimore interest will remove to this location.

The Pennsylvania Power & Light Co., Allentown, Pa., is having plans completed for the erection of a power house in the vicinity of Freemansburg, Pa., for service at Bethlehem and vicinity, estimated to cost $200,000 with equipment. Steel tower transmission lines will also be built.

The Lehigh Valley Railroad Co., Allentown, Pa., is considering the removal of its locomotive repair shops from Delano, Pa., to Hazleton. The shops at Ashmore will be extended to handle repair work for the Hazleton and Mahanoy Division, heretofore carried on at Delano.

A machine shop and automobile parts manufacturing department will be installed in the building now being erected at 42-44 North Cameron Street, Harrisburg, Pa., by the Automobile and Aeroplane School, 25 North Cameron Street, estimated to cost $65,000. It is purposed to have the structure ready for occupancy in August.

The Board of Education, Coplay, Pa., is planning for the establishment of a manual training department in the basement of the present high school. A list of machine tools and other equipment will soon be arranged.

The C. A. Hughes Coal Co., Altoona, Pa., is planning for the installation of additional electric power and other equipment at the property of the Mountain Quality Coal Co., Twin Rocks, Pa., recently acquired.

An electric power station will be constructed by the Bell Telephone Co., Allentown, Pa., at its proposed new relay plant between Allentown and Emaus, estimated to cost $250,000.

The Reading Home Ice Co., Inc., Reading, Pa., recently organized with a capital of $200,000, has plans for the construction of a new ice-manufacturing plant at Hyde Park, near Reading, to cost about $85,000, including equipment. Ernest B. Posey heads the company.

Frederic H. Hill and H. Root Palmer, Harrisburg, Pa., are organizing the South Creek Township Electric Co., the Columbia Township Electric Co. and the Springfield Township Electric Co., to install and operate power plants and systems in the three respective districts. The new companies are represented by Spencer G. Nauman and J. E. B. Cunningham, Harrisburg.

The Shenango Pottery Co., New Castle, Pa., will install electric power equipment and other machinery at its plant in connection with proposed enlargements. The company has increased its capital from $230,000 to $750,000 to provide for the expansion.

The Consolidated Power, Heat & Light Co., Honesdale, Pa., has tentative plans for extensions in its power plant and system. A controlling interest in the company was recently acquired by N. M. Seabrease & Co., Land Title Building, Philadelphia.

The Harrisburg Building Block Co., Harrisburg, Pa., has commenced the erection of a new plant for the manufacture of concrete blocks and other concrete products in the industrial district now being developed between Paxton Creek and Cameron Street. It will cost about $30,000.

The Eastern Steel Co., Pottsville, Pa., will build an addition to its plant.

## New England

BOSTON, June 4.

BUYERS showed even less interest in machine tools the past week than heretofore. The tendency appears to be to get along with present equipment, possibly because of a slowing up in forward bookings. This is demonstrated by the inability of dealers to close on machines that have been under negotiation for a long time. In addition, expansion in the New England metal-working industries is at a minimum. The General Electric Co., West Lynn, Mass., inquiring for 10 lathes, will not buy, but will take the tools required from its various shops.

Sales were fairly evenly divided between new and used tools the past week, and include one 10 x 30 in. Norton grinder, one new 13 in. Flather lathe, two Brown & Sharpe used automatics, a used No. 2 Milwaukee milling machine, a used No. 2 Foster screw machine, a new South Bend 16 in. x 8 ft. lathe, a used No. 25 Becker milling machine and a new drill press, and a used 14 in. x 6 ft. lathe.

Boston dealers attended the auction sale of the Williams Mfg. Co., Montreal, but made no purchases. The attendance was small and the bulk of the best equipment was purchased by interests formerly connected with the company at high prices, who propose to continue to manufacture at least some of the products made by the liquidating company. Prices paid, together with a 30 per cent duty on Canadian machinery, eliminated Boston buyers as factors

in the bidding. Inferior machinery sold at practically junk prices.

The market on Black & Decker heavy duty electric drills is about 10 per cent higher, and on screw drivers about 15 per cent. The American Swiss File & Tool Co., Elizabeth, N. J., has advanced prices 10 to 20 per cent, depending on the style of the file. The Noera Mfg. Co. line of zinc coated tin oilers, heretofore 40 per cent discount, is now 33⅓ per cent.

The Sanders Engineering Co., Portland, Me., is erecting a two-unit power plant on the Androscoggin River at the mouth of the Peabody River for the Twin State Gas & Electric Co.

Harry N. Atwood has awarded contract to the H. P. Cummings Construction Co. to erect at Monson, Mass., a plant to be used for the manufacture of automobile disk wheels by a new process.

The Hopkins Mfg. Co., 80 Boylston Street, Boston, machinery, has plans in progress for the erection in Brighton, Boston, of a new factory.

Work has been started on a manufacturing plant to be erected for the Camden & Rutland Power Co., Rutland, Me.

Bids have been asked for the erection of an addition to the Technical High School, Springfield, Mass. Plans call for about half the accommodations of the original set and involve shops mostly.

The Missisquoi Pulp & Paper Co., Sheldon Springs, Vt., bristol board, will build a manufacturing unit and power house and make other improvements to cost about $500,000.

The Townsend Mfg. Co., Walnut Street, Hartford, Conn., manufacturer of riveting machines, has awarded contract to the E. W. Canning Co., 246 Laurel Street, for a two-story addition.

The Palmer Steel Co., Holyoke, Mass., has commenced the erection of a one-story addition, 50 x 100 ft., estimated to cost $12,000, exclusive of equipment.

The Dodge Motor Car Co., Pittsfield, Mass., is considering the erection of a one-story service and machine works, 60 x 100 ft., on Ashland Street, North Adams, Mass., estimated to cost $30,000.

The Essex Brass Foundry Co., University, Boston, has purchased property at Cambridge, Mass., totaling 20,000 sq. ft., as a site for a new foundry, for which plans will be prepared at once.

The Hunt-Spiller Mfg. Corporation, 383 Dorchester Avenue, Boston, will build a one-story power house at its foundry.

The Barker Lumber & Box Co., Milford, Me., has tentative plans for rebuilding the portion of its plant destroyed by fire May 31, with loss estimated at $50,000, including machinery.

A machine shop and parts department will be installed in the four-story automobile service building, 90 x 185 ft., to be erected by the Chamberlain Garage, Inc., Boston, care of L. Joselyn, 339 Newbury Street, architect, estimated to cost $275,000.

The Andrew B. Hendryx Co., 86 Audubon Street, New Haven, Conn., manufacturer of brass goods, has awarded a general contract to the Dwight Building Co., 67 Church Street, for a four-story addition, 42 x 50 ft., to cost $42,000.

The Twin State Gas & Electric Co., Gorham, N. H., will commence the construction of a two-unit hydroelectric power plant on the Androscoggin River, estimated to cost $250,000, with machinery.

W. H. Partridge, 20 Brook Street, Wellesley, Mass., is planning for the installation of stone crushing equipment, conveying and loading equipment, and other apparatus.

M. J. Daly & Sons, Inc., 541 Bank Street, Waterbury, Conn., machinery dealer, has inquiries out for equipment for a boiler and plate shop, including bending rolls, rotary bevel shears, horizontal punch, splitting shears and other apparatus.

The Boston Elevated Railway Co., Boston, has awarded a general contract to the Simpson Brothers Corporation, 77 Summer Street, for four car repair shops at Everett, Mass., each one-story, 150 x 360 ft., 107 x 360 ft., and two 25 x 55 ft., respectively.

The New England Power Co., Worcester, Mass., has disposed of a bond issue of $1,800,000, a portion of the proceeds to be used in connection with a hydroelectric power project on the Deerfield River.

A portion of the plant and property of the Hills Hardware Co., Rockville, Conn., was destroyed by fire May 28 with loss estimated at $100,000, including buildings, equipment and stock.

A one-story steam-operated power house, 50 x 55 ft., with capacity of 1500 hp., will be constructed at the plant of the Uxbridge Worsted Co., Uxbridge, Mass.

A manual training department will be installed in the three-story high school to be at Plainville, Conn., estimated to cost $300,000. L. S. Mills, 58 Main Street, is secretary of the Board of Education, in charge.

The Cambridge Electric Light Co., Cambridge, Mass., is disposing of a stock issue of $468,000, the entire proceeds to be used in connection with extensions in generating plants and system.

The Dutee-Wilcox-Flint Co., Inc., 51 Broadway, New Haven, Conn., has awarded a contract to Sullivan & McKeown, 937 Dixwell Avenue, for a one-story addition, 50 x 170 ft., to its automobile assembling plant, to cost $45,000 with equipment.

A traveling crane, conveying machinery and power equipment will be installed in the new creosote wood-treating plant to be built by the Boston & Maine Railroad Co., Boston, at Nashua, N. H., where an 80-acre tract has been acquired. The plant will cost approximately $150,000.

A manual training department will be installed in the new high school to be erected at Ware, Mass., estimated to cost $150,000, for which plans are being drawn by J. D. Leland & Co., 41 Mount Vernon Street, Boston.

The American Wringer Co., Inc., Woonsocket, R. I., has been organized with a capital of $400,000 to take over and expand the plant of the company of the same name. The new organization is headed by Edward H. Rathbun, Charles M. Cook and Sullivan Ballou.

## Baltimore

BALTIMORE, June 4.

FIRE, May 29, caused damage estimated at more than $100,000 at the plant of the Lafayette Mill & Lumber Co., 2100 West Lafayette Avenue, Baltimore. J. J. Duffy, Jr., is general manager.

W. S. Austin, Maryland Trust Building, Baltimore, is inquiring for used equipment, including a 150 hp. horizontal return tubular boiler, 150 lb. pressure, boiler feed pump, open-type feed water, receiving tank, etc., all used equipment.

The Porcelain Enamel Mfg. Co., Highlandtown, Baltimore, is planning to erect a one-story brick factory, 100 x 520 ft., at a cost of about $96,000.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until June 12 for one motor-generator set, one switchboard panel, cable and miscellaneous electric equipment, schedule 863.

A machine shop and parts department will be installed in the one-story automobile service building, 100 x 140 ft., to be erected at Mount Rainier, Md., by Milor & Homan, 1627 K Street, Washington, to cost approximately $45,000.

The Peerless Mfg. Co., Fredericksburg, Va., has leased the one-story, sawtooth building, 80 x 130 ft., to be erected by the Fredericksburg Industrial Corporation, for the establishment of a new plant to manufacture surveying instruments. A department will also be installed for the manufacture of metal pencils and kindred specialties.

The Potomac Edison Co., Hagerstown, Md., is being organized to take over the properties of the Williamsport Power Co., Williamsport, Md. It will also acquire and merge the Edison Electric Illuminating Co. and the Cumberland Electric Railway Co., both of Cumberland, Md., and will be closely affiliated with the Potomac Public Service Co. The new organization will sell at once a bond issue of $2,900,000, the larger portion of the proceeds to be used for extensions and improvements, including the construction of a steam-electric generating plant at Williamsport, Md., with capacity of 20,000 hp., originally arranged as a project of the Williamsport Power Co. It will be designed for an ultimate output of 240,000 hp. M. F. Riley is president.

The Wilson-Hock Co., City Point, Va., machinery dealer, has inquiries out for several heavy duty stationary engines, Corliss type, 250 to 350 hp. Also, for two 250 to 350 kva. electric generators, belted type, and one 400 to 500 kw. generator, direct-connected to Corliss engine; one bucket elevator, sprocket chain type, and 15-ton locomotive crane, 45 to 50 ft. boom, suitable for handling magnet.

The O. L. Williams Veneer Co., Sumter, S. C., recently organized with a capital of $500,000, plans the establishment of a local mill with power house, estimated to cost $100,000 with machinery. O. L. Williams is president.

The Georges Creek Coal Mining Co., Lonaconing, Md., will install electric power, pumping and mining machinery at the former properties of the American Coal Co. The installation is estimated to cost close to $200,000. L. F. Gerdetz is engineer.

The Bureau of Yards and Docks, Navy Department, Washington, will take bids until June 20 for power plant equipment for installation at the station at Yorktown, Va., specification 4826.

The Smith Mfg. Co., Lynchburg, Va., recently organized with a capital of $100,000, contemplates the establishment of a plant for the manufacture of kitchen utensils and metal household appliances. R. L. Smith is president and R. B. Krebbs secretary.

The Board of Directors, Caswell Training School, Kinston, N. C., is taking bids on a general contract for a new industrial building for boys. A cold storage plant and mechanical laundry building will also be constructed. H. A. Underwood, Commercial Bank Building, Raleigh, N. C., is engineer.

An electrically-operated pumping plant will be installed at the municipal waterworks, Staunton, Va., in connection with a new water supply system to cost in excess of $1,000,000. Fuller & McClintock, 170 Broadway, New York, are consulting engineers.

The J. G. Shelton Co., Inc., Railway and Power Building, Richmond, Va., machinery dealer, is inquiring for a 15-ton locomotive crane, 4-wheel, double drum, 35 to 40 ft. boom.

A manual training department will be installed in the new high school to be erected by the Cecil County School Board, Elkton, Md., on 3-acre site, estimated to cost $150,000, for which plans will soon be prepared.

The Bethlehem Steel Co., Baltimore, has plans for the installation of an absorption plant at its Sparrows Point works for benzol production, to cost in excess of $100,000, with equipment.

R. L. Gwyn, Lenoir, N. C., has inquiries out for pumping equipment for deep-well service.

The Spruces Automobile Repair Shop, Seven Pines, Richmond, Va., is making inquiries for a lathe, drill press and other equipment.

A power house will be constructed by the Arcadia Mills, Inc., Spartanburg, S. C., in connection with a new textile plant to cost about $200,000, for which plans have been prepared by F. H. and J. G. Cunningham, Greenville, S. C., engineers. H. A. Ligon, Jr., is treasurer and general manager.

The Miles Lumber Co., Norfolk, Va., recently formed with a capital of $250,000, is planning the erection of a new mill and power house to cost close to $100,000, with equipment. G. Benson Ferebee is president.

Manual training equipment will be installed in the new high school to be erected at Murphy, N. C., estimated to cost $100,000, for which bids are being taken on a general contract. Frank B. Simpson, Raleigh, N. C., is architect.

Thomas M. Walker, Hamilton, Ga., is organizing a company to build a plant for the manufacture of brick, tile and kindred products. A power house will be installed.

The Southern Portland Cement Co., Macon, Ga., recently formed under Delaware laws with a capital of $6,000,000, has perfected plans for the construction of its cement manufacturing works at Ainslie, Ga., estimated to cost $1,500,000 with machinery. W. Jordan Masse, president of the Bibb Brick Co., Macon, heads the new company.

A power house and machine shop will be built at the new mill to be erected by the Southern Worsted Corporation, Greenville, S. C., estimated to cost $1,000,000, for which plans have been prepared by Lockwood, Greene & Co., Charlotte, N. C., engineers.

The Honea Path Oil Mill Co., Honea Path, S. C., is planning the installation of additional machinery, including power equipment, at its cottonseed oil mill.

Manual training equipment will be installed in the addition to be erected at the Burke Industrial School, Charleston, S. C., plans for which have been approved by the Board of Public School Commissioners, A. Burnett Rhett, superintendent.

The Hackley-Morrison Co., Inc., 1708 Lewis Street, Richmond, Va., machinery dealer, is inquiring for a used double-cylinder, single-drum mine hoist, with drum 36 to 48 in. in diameter.

## Buffalo

BUFFALO, June 4.

PLANS are being considered by the F. B. Rae Oil Co., foot of Ambrose Street, Rochester, N. Y., for rebuilding the portion of its plant destroyed by fire May 25 with loss estimated at $300,000, including equipment.

The Los Angeles Tool Co., 209 Hopkins Street, Jamestown, N. Y., is planning the installation of machine tools and other equipment in a local building.

The Common Council, Nunda, N. Y., is planning the installation of a pumping plant at the municipal waterworks, to replace the station recently destroyed by fire.

A merger has been effected between the Western New York Utilities Co., Batavia, N. Y., and the Genesee Light & Power Co., operating in the same district, under the first noted name. The consolidated company will have an operating capital of $950,000. Plans are under way for extensions and improvements for which a portion of a recent bond issue of $560,000 will be used.

Beavan & Chapman, Main Street, Endicott, N. Y., are planning the establishment of a new factory for the manufacture of timing equipment for automobile service, including lathes, bench tools, etc.

The New York Canners, Inc., Rochester, N. Y., has tentative plans for rebuilding the portion of its plant, machine shop and automobile service building destroyed by fire May 26, with loss estimated at $90,000 including equipment.

A manual training department will be installed in the proposed high school to be erected at Nunda, N. Y., estimated to cost $125,000. School District No. 1, J. M. Nelson, secretary, is in charge.

The Genesee Stone Products Co., Batavia, N. Y., is planning the installation of stone crushing machinery, power, conveying and other equipment. A. B. Caldwell is in charge.

Conveying machinery, grinding and other equipment will be installed in the new two-story and basement plant to be erected by the Pectoral Plaster Co., Glens Falls, N. Y., estimated to cost $30,000. Wetmore & Crandall, Inc., Glens Falls, is architect.

The Syracuse Lighting Co., Syracuse, N. Y., has plans for enlargements in power houses and system and will use a portion of the fund to be secured from an increase in capital from $6,000,000 to $20,000,000 for this purpose.

The W. H. Loomis Talc Co., Gouverneur, N. Y. is perfecting plans for the installation of hoisting, conveying and other machinery at its properties.

The Flower City Pipe & Iron Corporation, Box 558, Rochester, N. Y., is inquiring for quantities of boiler tubes.

## Detroit

DETROIT, June 4.

CONTRACT has been awarded by the Hupp Motor Car Corporation, 3501 East Milwaukee Street, Detroit, to the Everett-Winters Co., Book Building, for the erection of a new plant on Mount Elliott Avenue for metal stamping and kindred automotive production, estimated to cost $500,000 with machinery.

The Michigan Central Railroad Co., Detroit, is taking bids on a general contract for extensions and improvements in its engine houses and repair shops on Palmer Avenue, Detroit, West Detroit and Bates City Junction.

A. N. Haskell, 1045 Hibbard Avenue, Detroit, is inquiring for a number of drill presses.

The Shaw Electric Crane Co., Muskegon, Mich., has commenced the erection of a two-story addition, 60 x 100 ft., estimated to cost $60,000, including equipment.

The Dearborn Ice Co., Dearborn, Mich, recently organized, has plans for a new ice-manufacturing and refrigerating plant to cost $45,000, with machinery. William Ford is president and James Limbert vice-president and general manager.

The Detroit United Railway Co., Detroit, is considering plans for rebuilding its car shops and barn on North Main Street, Rochester, Mich., recently destroyed by fire.

The Lloyd Mfg. Co., Menominee, Mich., manufacturer of children's vehicles, is takings bids for a three-story addition on State Street, 70 x 400 ft., to provide for about 50 per cent increase in capacity. It will cost approximately $75,000.

A manual training department will be installed in the proposed two-story high school to be erected at Watervliet, Mich., estimated to cost $150,000, for which plans have been prepared by R. A. Leroy, 121 Pratt Building, Kalamazoo, Mich.

The Detroit Edison Co., Detroit, will issue bonds for $8,000,000 and stock for $9,000,000, a large part of the proceeds to be used for extensions in electric generating plants and transmission system.

The La Mar Pipe & Tile Co., Grand Rapids, Mich., recently organized with a capital of $200,000, will build a new plant on the property of the Grand Rapids Gravel Co., La Mar, for the manufacture of cement tile, pipe, etc. It will cost about $80,000 with machinery. N. H. Battjes is president and J. Kent Wilson general manager.

A machine shop will be installed in the twenty-story automobile service building to be erected by the Book Estate, 1225 Book Building, Detroit, estimated to cost $700,000 with equipment. Louis Kamper, 3729 Cass Avenue, is architect.

Manual training equipment will be installed in the high school to be erected at Marine City, Mich., estimated to

cost $125,000. H. B. Thompson, superintendent of schools, is in charge.

The Ford Motor Co., Highland Park, Mich., will build a machine shop, forge shop and wood-working plant at L'Anse, Mich., in connection with its raw material plants in this section.

The Zenith Carburetor Corporation, Detroit, has been organized with a capital of $250,000 to take over and expand the plant and business of the company of the same name, with factory on Fort Hart Avenue.

The Sinclair Oil Refining Co., 111 West Washington Street, Chicago, is planning the erection of a new oil storage and distributing plant at Battle Creek, Mich., estimated to cost $75,000, with equipment.

The Stafford Roller Bearing Car Truck Corporation, Lawton, Mich., contemplates the purchase of about $20,000 worth of machinery for the manufacture of small bearings for automobiles, trucks, tractors and commercial use. Buying will begin as soon as an additional factory can be erected, which will probably be about October.

## Pittsburgh

PITTSBURGH, June 4.

MACHINE tool business has shown some increase the past week, although many in the trade find it quiet. The Union Railroad, the interplant connecting system in the Pittsburgh district of the United States Steel Corporation, recently bought a combination axle, lathe and journal truing machine from the Consolidated Machine Tool Corporation and is expected to close soon for a car wheel borer. The Pennsylvania Railroad has given the verbal order for a 2-in. forging machine for its Pitcairn, Pa., shops and it is understood has all bids compiled and will soon make awards against a number of tools for its Conway shops.

There is a fair amount of activity in cranes. One crane representative here is figuring on no less than 15 and expects that more than half will be placed in the near future. Makers of rolling mills and rolling mill equipment have lately found new business rather slow, but with the slackening steel orders, manufacturers are disposed to move cautiously about placing contracts.

The Shenango Furnace Co., Oliver Building, Pittsburgh, is expected to start work soon on rebuilding its machine shop destroyed by fire May 27. George Collard is general manager and Paul Menke, Sharpsville, Pa., superintendent.

The Westinghouse Air Brake Co., Wilmerding, Pa., recently closed with Manning, Maxwell & Moore, Inc., for 10 1-ton I-beam trolleys, together with the beams and the rails.

The Standard Spring Co., 2127 Wright Street, Pittsburgh, manufacturer of automobile springs, etc., is having plans drawn for a two-story and basement addition, 45 x 49 ft. C. R. Geisler, Ferguson Building, is architect.

The Corry-Jamestown Mfg. Co., Corry, Pa., manufacturer of metal furniture, has acquired the factory formerly occupied by the Corry Mattress Co., and will remodel it for a new plant. Plans are also being prepared for an addition.

The Moxham Lumber Co., Park and Griffith Streets, Johnstown, Pa., is planning for the installation of additional equipment, including a planer, shaper, rip saw and smaller tools.

The Erie County Electric Co., Erie, Pa., will commence the erection of an addition to its power plant to cost $30,000, exclusive of equipment.

Manual training equipment will be installed in the new high school to be erected at Southmont, Pa., estimated to cost $110,000, for which bids are being asked on a general contract until June 11. Perry Campbell, Park Building, Johnstown, Pa., is architect.

The Richmond Radiator Co., 1480 Broadway, New York, has awarded contract to the Truscon Steel Co., Youngstown, Ohio, for a one-story addition to cost $50,000.

The Weston Electric Light, Power & Water Co., Weston, W. Va., is planning for extensions in its power plant and system for service at Shadybrook, Halesville and vicinity. Additional machinery will be installed.

A manual training department will be installed in the new high school to be constructed at Dunbar, W. Va., estimated to cost $90,000, for which bids are being received on a general contract until June 15. Walter F. Martens, Charleston, W. Va., is architect.

The Chesapeake & Ohio Railroad Co., Richmond, Va., will make improvements and extensions in its engine terminal at Taplin, W. Va., to include the installation of a cinder conveyor system, 100 ft. turntable, pumping and water station for locomotive service and other equipment, estimated to cost $200,000.

W. S. Fulton, 433 Masonic Temple, Charleston, W. Va., has inquiries out for a number of hydraulic presses.

Fire, May 26, destroyed a portion of the plant of the Beaver Refining Co., Henderson Avenue, Washington, Pa., with loss estimated at $500,000, including buildings and machinery. It is planned to rebuild.

The United States Fibre Box Co., Roosevelt Avenue and Martindale Street, Indianapolis, has awarded a contract to J. A. Shumacher, Indianapolis, for a new two-story plant at Warwood, W. Va., 80 x 200 ft., estimated to cost $70,000, with machinery.

An electrically-operated pumping plant will be installed in connection with the proposed new sewerage disposal works at Sharon, Pa., estimated to cost $200,000.

The Irwin Gas Coal Co., Greensburg, Pa., recently organized as a consolidation of the company of the same name and the Ninevah, Salem and Amend Coal companies, with total assets of $3,000,000, has tentative plans for the installation of additional electric power and other machinery at its properties at Export and Seward, Pa. R. H. Jamison is president.

The Board of Education, Sistersville, W. Va., is planning for the establishment of a manual training school in connection with the present high school. The equipment will be purchased and donated by W. J. Neuenschwander, a prominent citizen of the city.

The Erie Motor Truck Co., Erie, Pa., has been acquired by new interests at a receiver's sale. Plans are under consideration for a reorganization of the company, with extensions and improvements for motor truck and parts manufacture.

The Reese Creek Coal Co., F. W. Cline, president, Milton, W. Va., recently organized, is considering the installation of electric power and other machinery on properties leased at Barboursville, W. Va.

A power house will be built at the proposed plant of the West Virginia Match Co., Wheeling, W. Va., recently organized with a capital of $300,000. The plant is estimated to cost $100,000, including machinery.

The Keps Electrical Supply Co., 961 Liberty Avenue, Pittsburgh, has leased the fourth and fifth floors in the building at 967 Liberty Avenue for extensions.

A machine shop and parts department will be installed in the new three-story and basement service building to be erected by the Clarksburg Automobile Co., Clarksburg, W. Va., estimated to cost $75,000. F. D. McEnteer, Clarksburg, is architect.

The Gardner Calculating Machine Co., Ebensburg, Pa., will commence the construction of a new two-story plant on High Street, estimated to cost $75,000, including machinery.

The Bailey-Farrell Mfg. Co., South Twentieth and Sidney Streets, Pittsburgh, manufacturer of pipe, steam fittings, etc., will erect a two-story branch at Second Avenue and Ninth Street, Huntington, W. Va., to cost about $30,000.

The Keystone Iron & Metal Co., Williamsport, Pa., is inquiring for a heavy duty vertical or horizontal gag press or bulldozer for breaking rails.

## Cleveland

CLEVELAND, June 4.

MACHINE tool builders and dealers did a moderate volume of business the past week but virtually no orders were for more than one or two machines. With the decline in sales the latter part of the month, the aggregate business in May fell off somewhat below that of April. The Toledo, Ohio, Board of Education, has issued a list of twenty-three high-grade machines, all motor driven, for the Edward D. Libbey High School, for which bids were received this week, and deliveries are wanted by Aug. 15. The list includes 11 engine lathes and the specifications are drawn to cover several well know makes, and provide that not more than two lathes shall be purchased from one manufacturer. With this exception no inquiry of any size came out during the week.

With several railroad lists pending the railroad field continues the most active. Little business

is coming from the automobile industry and this makes the Detroit territory particularly quiet. Some new inquiry has come from Akron rubber companies for lots of four or five machines for mechanical goods department, but these companies are not buying for tire departments.

The Michigan Central Railroad during the week purchased several machines against its recent list, including a turret lathe from a Cleveland manufacturer. This company also booked orders for four large turret lathes, two for the Westinghouse Air Brake Co. and two for the Owens Bottle Machine Co.

The list issued by the Toledo Board of Education includes the following:

One 15-in. lathe, to swing 39-in. between centers.
Two 14-in. x 6-ft. lathes.
One 14-in. x 6-ft. geared head lathe.
One 16-in. x 8-ft. geared head lathe.
One 16-in. x 6-ft. geared head lathe.
One 17-in. x 6-ft. geared head lathe.
Three 18-in. x 6-ft. geared head lathes.
One 12-in. x 4-ft. speed lathe.
Two No. 2 universal milling machines.
One 21 x 12 x 17-in. vertical milling machine.
One 20-in. x 30-in. x 8-ft. planer.
Two 20-in. shapers.
One high speed hack saw.
One 26-in. upright drilling machine.
One 15-in. sensitive drilling machine.
One 2½-ft. high speed vertical milling machine.
One 12 x 30-in. universal grinding machine.
One universal tool and cutter grinder.

The Wellman-Seaver-Morgan Co., Cleveland, has taken an order from the Great Northern Power Co., Duluth, for hydroelectric equipment for its Fond du Lac powder station. This plant will have a capacity of 15,500 hp. and the units will be operated at 120 r.p.m. under a 78-ft. head. The steel plate spiral casting will have an inlet 14½ ft. in diameter, being one of the largest ever built. The Wellman-Seaver-Morgan Co. has also taken an order for the reconstruction of a 15,000 hp. turbine for the Ocoee No. 1 plant of the Tennessee Electric Power Co., Chattanooga, Tenn.

The plant of the Grant Motor Car Corporation, Cleveland, has been sold by the receiver to the Lincoln Electric Co. for $425,000, which will shortly move to the new location. The plant has 177,000 sq. ft. of floor space, or four times the space of the present Lincoln works. The products of the company include motors and arc welders.

The plant of the Cleveland Brass & Copper Mills., Inc., which was offered at public auction the past week, was bid in by the Government for $350,001. The Government held a claim against the company growing out of financing during the war.

The Maumee Finishing Co., Toledo, Ohio, will erect a factory, 60 x 100 ft.

The Hughes Supply Co., Mansfield, Ohio, has placed contract for a building for warehouse purposes. The company does a jobbing business in plumbers' supplies and contractors' material and will add heavy hardware to its present lines.

The American Can Co. has acquired under lease the plant of the Chisholm Shovel Co., 1588 East Fortieth Street, Cleveland, and will equip it for manufacturing purposes. The plant includes several buildings having an aggregate floor space of 50,000 sq. ft.

The Zanesville Engineering & Refrigerating Co., Zanesville, Ohio, which was recently organized, will shortly begin operations. The company has elected John F. Brown president; L. H. Wise vice-president; J. N. Palmer, secretary and general manager, and C. W. Albertson treasurer.

## Cincinnati

CINCINNATI, June 4.

WHILE buying has fallen off to some extent in the machine tool industry, a fair volume of orders continues to be booked, with indications of good buying in June, particularly from the railroads. Most of the orders are for one and two machines and come largely from industrial companies, the machine tool industry taking a few tools from time to time. The Norfolk & Western Railroad issued an inquiry last week for 43 machines on which bids are to be opened today. It is expected that this list will be bought very soon. Pending business from Middle Western roads is heavy.

The Hanna Stoker Co., Cincinnati, manufacturer of the Hanna locomotive stoker, has completed its new plant in the Madisonville section of the city, and is moving its equipment from the old plant on Wade Street. The new works is on the line of the Pennsylvania Railroad and ample provision has been made for expansion. The company has purchased a number of machine tools and will have a completely equipped machine shop.

Contract for a new engine house for the Illinois Central Railroad at Central City, Ky., has been awarded to Joseph E. Nelson & Son, Chicago. It will include 12 stalls, a round house, cinder pit, machine shop and a turntable.

The Springfield Spring Co., Springfield, Ohio, has awarded contract for an addition, 31 x 260 ft., to cost $10,000. It will be used as a warehouse and for additional manufacturing space.

The Buckeye Tile Co., Chillicothe, Ohio, is building an addition, 100 x 195 ft., in which a complete machine shop will be installed. It will also install some material handling equipment as well as machinery for making tile. E. J. Hydell is general manager.

The Piqua Paper Box Co., Piqua, Ohio, is erecting an addition, 80 x 120 ft., three stories, and will install paper box making machines. Meyer Louis is president.

## Chicago

CHICAGO, June 4.

THE Union Pacific has closed for the remainder of the list for its main line, but has not yet taken action on the inquiries published in this column a week ago which are for its subsidiaries. Its purchases involve over $90,000 and cover one 16-in., one 24-in., two 20-in. and two 18-in. engine lathes, two 14-in. portable lathes, a 36-in. planer, two 24-in. planers, a locomotive link grinder, a 2¼-in. turret lathe, a 54-in. boring mill, two bolt cutters, a locomotive cylinder boring bar and three motor-driven dry grinding machines. The Chicago & North Western has bought two used journal turning lathes, but has made no further purchases against its list. The Chicago, Burlington & Quincy has put out an inquiry consisting of 93 items.

Action has not yet been taken on the Elgin, Joliet & Eastern, the Denver & Rio Grande Western, the Santa Fe, the Pere Marquette and Rock Island lists. The amount of railroad business now pending is the largest in the memory of local machine tool houses. Prospects for June are therefore regarded favorable, although May sales fell considerably short of the March totals and in some instances were below those of April. Business from industrial sources is light and new inquiries are few.

*Chicago, Burlington & Quincy List*

One motor-driven 16-in. portable engine lathe, 36 in. between centers.
One single-pulley driven 18-in. engine lathe, 96 in. between centers.
Three motor-driven 18-in. engine lathes, two with 60 and one with 72 in. between centers.
One belt-driven 18-in. engine lathe, 48-in. between centers.
One motor-driven 18-in. engine lathe, 48 in. between centers.
One motor-driven 18-in. engine lathe, 54 in. between centers.
One 18-in. motor-driven engine lathe, 51 in. between centers.
One motor-driven 18-in. engine lathe, 72 in. between centers.
One motor-driven 20-in. engine lathe, 96 in. between centers.
One motor-driven 20-in. brass lathe with turret head, 36 in. between end of spindle and face of turret.
Two motor-driven 20-in. heavy duty engine lathes, 96 in. between centers.
One motor-driven 20-in. engine lathe with turret head, 48 in. between end of spindle and face of turret.
Three motor-driven 24-in. engine lathes, 96 in. between centers.
One motor-driven 16-in. engine lathe, 60 in. between centers.
One motor-driven 24-in. engine lathe, 120 in. between centers.
Four motor-driven 30-in. engine lathes, 120 in. between centers.
One belt-driven 30 in. engine lathe, 120 in. between centers.
One motor-driven 36-in. engine lathe, 120 in. between centers.
One 2 x 24-in. motor-driven turret lathe.
One single pulley-driven universal turret lathe with 3½-in. hole through spindle.
One motor-driven turret lathe adapted and tooled for turning and threading crown stays up to 1⅜ in. in diameter by 36 in. long, with die head for taper and for straight threading.
One motor-driven 2¼-in. turret lathe with 18-in. swing.
One motor-driven heavy duty turret lathe to swing 26 in. over ways and equipped with a 24-in. four-jaw scroll chuck.
One motor-driven thread milling machine equipped for milling on studs ½ in. up to 1¼ in. in diameter, 2 to 10 in. long.

Two belt-driven double-spindle bolt threaders to thread bolts up to 2 in. in diameter.

One motor-driven double-spindle staybolt threading machine arranged with two lead screws to insure cutting threads to perfect pitch.

Two belt-driven horizontal type bolt threading machines with two spindles and lead screw attachments for cutting staybolts ¾ to 1½ in. in diameter up to 18 in. long, 12 threads to the inch.

One belt-driven pipe threading machine with capacity to thread pipes from 2 to 6 in. inclusive.

One pipe threading machine arranged for all kinds of bends on pipes up to 4 in. in diameter.

One motor-driven slotting machine with 18-in. stroke, diameter of table 40 in., distance from ram 40 in., 30 in. from table to frame.

One single pulley-driven vertical type boring mill with two swivel heads on cross rail.

One motor-driven 48-in. vertical boring mill.

One motor-driven 52-in. vertical boring mill.

Two motor-driven 42-in. vertical turret lathes with one turret head on cross rail and one side head on right housing.

One motor-driven 36-in. vertical turret lathe.

One motor-driven special type vertical boring mill with 42-in. swing, with one vertical head suitable for boring driving boxes and a horizontal head for facing with automatic centering chuck for driving boxes.

One motor-driven 54-in. vertical boring mill.

Two motor-driven 42-in. vertical boring mills.

One motor-driven power hack saw to cut bars 6 x 6 in.

One motor-driven double-spindle cotter drill arranged for cutting keyways in locomotive piston rods and cross heads with power automatic feed and return full length of keyway up to ½ in. wide 6 in. long.

One motor-driven portable boring machine to bore cylinders 22 up to 30 in. x 36 in. to 42½ in. long.

Six belt-driven 34-in. upright drill presses with capacity for 2-in. hole in solid steel.

One belt-driven double-spindle upright drill press with capacity to drill up to ¾-in. holes.

One motor-driven 26-in. upright drill press, capacity 1½-in. hole in solid steel.

One motor-driven 20-in. upright drill, capacity 1½-in. hole in solid steel.

One belt-driven 36-in. upright drill, capacity 1½-in. hole in solid steel.

One belt-driven 26-in. upright drill, capacity 1½-in. hole in solid steel.

One belt-driven post drill, capacity holes up to 1 in. in diameter.

One 42 x 42-in. x 12-ft. heavy duty planer with variable speed reversing motor drive and controller.

One 42 x 42-in. x 10-ft. planer with variable speed reversing motor drive and controller.

Five 32-in. crank shapers, four motor-driven and one arranged for belt drive.

One motor-driven 54-in. vertical adjustable rotary milling machine with two sets of ways at right angles, 40 x 46 in. over shears, with box section head.

One motor-driven heavy duty universal milling machine, No. 5 Cincinnati, or equivalent.

One belt-driven high speed stop motion bulldozer, cross head width 8 ft. 8 in., cross head height 13 in., operating speed 30 strokes per min.

One motor-driven plate bending roll, capacity ⅜-in. plates, 48 in. wide.

One motor-driven heavy duty 5-in. forging and upsetting machine.

One motor-driven single end combination punch and shear, vertical open gap, 36-in. throat, capacity 1¼-in. hole in 1-in. plate.

One motor-driven vertical type surface grinding machine with rotating magnetic chuck, suitable for cylinder packing rings up to 36 in. in diameter.

One motor-driven double end pedestal grinding machine to carry two 18 x 3-in. dry emery wheels.

Three 400-ton horizontal type hydraulic presses for car wheels up to 42-in. in diameter, distance between bars 48 in. and 100 in. from ram to distance post. Two machines arranged for motor drive and one for belt drive.

One motor-driven 50-ton vertical type press for pressing bushings in locomotive side rods, 40 in. between housings.

One belt-driven Atlas improved No. 2 hair picker, or equivalent, for picking moss and hair for upholstery shop.

Four economy combustion chambers, or equivalent, to be used on oil furnaces.

One belt-driven 6-in. flue cleaner to remove scale from exterior surface when flues are out of boiler.

One shaving baler for baling shavings for fuel.

One foot-power squaring shear, capacity No. 18 gage sheet iron, 36 in. between housings.

One hand-operated cornice brake, capacity No. 12 gage steel, to take 10 in. between centers.

Fred W. Steiner, 3340 Southport Avenue, Chicago, has let a contract for a one-story machine shop, 49 x 51 ft., at 3015-19 Ravenswood Avenue, to cost $10,000.

The Curtis Ledger Fixtures Co., 1115 West Jackson Boulevard, Chicago, has let contract for a six-story factory, 56 x 178 ft., at 1119-29 West Jackson Boulevard, to cost $225,000.

The Western Shade Co., 2100 South Jefferson Street, Chicago, has let contract for a four-story factory, 85 x 290 ft., at 2023-2163 Jefferson Street, to cost $400,000.

Michael Espert, 236 North Clark Street, Chicago, has let a contract for a six-story automobile service station and storage building, 99 x 258 ft., on Dearborn Street, between Twenty-sixth Street and Twenty- sixth Place to cost $230,000.

The Bersted Mfg. Co., manufacturer of automobile accessories, 771 Mather Street, Chicago, has added to its producing facilities by leasing 7000 sq. ft. of floor space at 1500 West Fifteenth Street.

The Reynolds Wire Screen Co., Dixon, Ill., has placed contract for an addition to cost $50,000.

Ground has been broken for a municipal electric light and power plant at Muscatine, Iowa.

The Interstate Public Service Co., Goshen, Ind., will, within the next five months, double the steam generating capacity of its Goshen power plant at a cost of $200,000.

The Chicago Nipple Mfg. Co., 1966 Southport Avenue, Chicago, has purchased a two-story factory on Clybourn Street and will utilize it as a pipe bending plant.

The Art Lamp Mfg. Co., 6 North Franklin Street, Chicago, has bought a seven-story building at 1433-37 South Wabash Avenue, 80 x 172 ft., and will occupy the structure for the manufacture of lamps.

The Link Belt Co., 910 South Michigan Avenue, Chicago, manufacturer of conveying machinery, etc., has awarded contract to the G. Thomson & Son Co., 30 North La Salle Street, for its one-story machine shop on West Pershing Road, 125 x 175 ft., estimated to cost $150,000, with machinery.

A manual training department will be installed in the two-story high school to be erected at Ziegler, Ill., estimated to cost $100,000, for which foundations will be laid at once. Ashby, Ashby & Schultz, 1511 West Jackson Boulevard, Chicago, are architects.

The Linwood Stone & Cement Co., 713 Kahl Building, Davenport, Iowa, is planning the erection of a new cement manufacturing plant to cost $150,000, including equipment. J. E. Schroeder is secretary and general manager.

A manual training department will be installed in the two-story and basement high school to be erected on Main Street, Keokuk, Iowa, estimated to cost $325,000, for which bids have been asked on a general contract. Temple & Burrows, 208 Main Street, Davenport, Iowa, are architects.

The Frank Foundry & Machine Co., 1735 West Second Street, Davenport, Iowa, will erect a new one-story and basement plant, 75 x 100 ft., at Twenty-first Street and Second Avenue, Moline, Ill. H. J. Frank is president.

The Home Oil Co., Arthur, Ill., is planning the construction of a new oil storage and distributing plant at Cerro Gordo, Decatur, Ill. F. C. Phillips is general manager.

A manual training department will be installed in the new three-story high school to be erected at Gordon, Neb., estimated to cost $110,000, for which bids will be called on a general contract early in June. E. B. Watson, Norfolk, Neb., is architect.

Manual training equipment will be installed in the new two- story high school to be erected at Mascot, Neb., estimated to cost $75,000, for which bids will be asked on a general contract early in June. The R. A. Bradley Co., Scottsbluff, Neb., is architect.

## The Central South

ST. LOUIS, June 4.

PLANS are being considered by the Chicago, Rock Island & Pacific Railroad Co., 139 West Van Buren Street, Chicago, for an addition to its engine house and shops at Caldwell, Kan., estimated to cost $40,000. A. T. Hawk is company architect.

The Sheet Metal Products Co., 1819 Central Avenue, Kansas City, Mo., has commenced the erection of a new one-story plant, 125 x 300 ft., at Seventeenth and Chestnut Streets, estimated to cost $65,000 including equipment. Wilkinson & Crans, 608 Interstate Building, are architects.

The Brady Regrinding Co., Main Street, Wellington, Kan., is planning for the installation of a power lathe, 16 in. J. J. Brady is head.

George S. Elder, St. Elmo, Tenn., has inquiries out for a rock crushing plant and auxiliary equipment.

The Consolidated Boll Weevil Insect Destroyer Co., Blanchard, Okla., recently organized, has contracted with the Chickasha-Hart Fan Co., Chickasha, Okla., for the manufacture of special machines to be used in connection with boll weevil elimination, to be of automatic blower type. Later the company proposes to establish its own plant for parts manufacture and assembling. John A. Stephenson is president and general manager.

A manual training department will be installed in the junior high school to be erected at Ottawa, Kan., estimated to cost $260,000, for which plans are being prepared by Washburn & Stockey, 222 South Main Street, architects.

The Industrial Sand & Gravel Corporation, Koehler Building, Lawton, Okla., is inquiring for a suction dredge.

The Stark Motor Co., 120 East Lincoln Street, Wellington, Kan., is planning the installation of a power lathe, cylinder grinder, drill press and other equipment. F. Stark is head.

A manual training department will be installed in the proposed high school to be erected at Delphos, Kan., estimated to cost $95,000, for which plans are being drawn by Lorentz, Schmitz & Co., Fourth National Bank Building, Wichita, Kan., architects.

The T. J. Moss Tie Co., Security Building, St. Louis, will build a new lumber plant and sawmill, with power house, at Wrape's Spur, Ark., to cost in excess of $60,000 with equipment.

The Warren Steel Casting Co., 3400 Maury Avenue, St. Louis, has tentative plans for rebuilding the portion of its foundry destroyed by fire May 23, with loss estimated at $43,000 including equipment.

The Putnam Mining Co., Cookeville, Tenn., recently organized, is planning the installation of electric power and coal mining machinery at its properties at Monterey, Tenn. O. K. Holladay is president.

Manual training equipment will be installed in the high school to be erected at Salisbury, Mo., estimated to cost $95,000, for which plans are being prepared by W. E. Hulse, Holke Building, Hutchinson, Kan., architect.

The Maxwell-Hill Co., Cookeville, Tenn., will commence the construction of a new ice and cold storage plant on local site.

Manual training equipment will be installed in the proposed high school to be erected at Frankfort, Ky., estimated to cost $95,000, for which plans are being prepared by J. H. Felt & Co., 800 Grand Avenue Temple, Kansas City, Mo., architects.

An electrically-operated pumping plant will be installed at the new waterworks system at McAlester, Okla., for which bonds for $375,000 have been voted. E. T. Archer & Co., 609 New England Building, Kansas City, Mo., are engineers.

The Okmulgee Power Co., Okmulgee, Okla., has acquired the property of the Antlers Ice & Light Co., Antlers, Okla. Plans are under way for extensions, including the construction of a new hydroelectric power plant on the Okmulgee River, estimated to cost $350,000.

The Medworth Machine Shop, Benton, Kan., is planning the installation of a new power lathe and other equipment. G. Medworth heads the company.

Manual training equipment will be installed in the new junior high school to be erected at Emporia, Kan., estimated to cost $400,000, for which preliminary plans are being prepared by J. H. Felt & Co., 800 Grand Avenue, Temple Building, Kansas City, Mo.

The Louisville Petroleum Refining Co., Louisville, has tentative plans for a new oil refinery with initial output of about 1000 bbl. per day, estimated to cost $250,000 with machinery.

The Arkansas Central Power Co., Little Rock, Ark., has authorized plans for an addition to its electric power plant to cost about $75,000. C. J. Griffith is general manager.

Manual training equipment will be installed in the proposed high school to be erected at Turon, Kan., estimated to cost $80,000, for which bids on a general contract will be called during June. Smith & English, Nelson Building, Hutchinson, Kan., are architects.

The Empire Gas & Fuel Co., Bartlesville, Okla., operating oil refineries, has disposed of a bond issue of $10,000,000, a portion of the proceeds to be used for extensions and improvements.

The Bridgeport Machine Co., Wichita, Kan., is in the market for two Lodge & Shipley lathes of the geared head type and arranged for motor drive. It is also inquiring for a Bullard new era vertical boring mill, motor-driven.

## The Gulf States

BIRMINGHAM, June 4.

BIDS will be received by the United States Engineer Office, Galveston, Tex., until June 25 for one screw-cutting motor-driven lathe, 24 in. x 10 ft., proposal 2967.

The Texas Tinners' Supply Co., Houston, Tex., is in the market for sheet metal working equipment and tools, power drill, punch, emery wheel, shears and other apparatus.

The Standard Machine Co., Inc., P. O. Box 744, Baton Rouge, La., recently organized, has secured a local building, 100 x 250 ft., for the manufacture of saw-mill machinery. J. A. Tinsley is secretary and treasurer.

Manual training equipment will be installed in the high school to be erected at Graford, Tex., estimated to cost $90,000, for which plans will be prepared at once.

Manual training equipment will be installed in the two-story high school to be erected at Dayton, Tex., estimated to cost $100,000. Milton W. Scott & Co., 422½ Franklin Street, Waco, Tex., are architects.

Bids will be received by the United States Engineer Office, Florence, Ala., until June 23, for 13 sets of sluice gates and operating mechanisms, with riveted steel pipe and auxiliary appurtenances for the Wilson dam.

The Meridian Fiber Co., Meridian, Miss., has plans for an addition to double the present capacity, estimated to cost $40,000 with machinery.

The International Harvester Co., 606 South Michigan Avenue, Chicago, has leased three units of the army supply base at New Orleans, recently taken over from the Government by the New Orleans Dock Board, for the establishment of a branch works.

A manual training department will be installed in the high school to be erected at Bay St. Louis, Miss., estimated to cost $100,000. The Board of Education will soon select an architect.

The Dallas Power & Light Co., Interurban Building, Dallas, Tex., is considering the construction of a new steam-operated electric power plant fronting on the line of the Missouri, Kansas & Texas Railroad Co., estimated to cost $400,000.

The Common Council, Shreveport, La., has abandoned plans for the construction of a municipal electric power plant, recently projected, to cost about $400,000.

The Acme Sand Co., Eustis, Fla., has inquiries out for a 60-hp. marine type Diesel engine, with auxiliary equipment.

The Board of City Commissioners, Fort Worth, Tex., will take bids until June 12 for a new electrically-operated pumping plant for the South Side waterworks, estimated to cost $150,000.

The Texas Steel Co., Fort Worth, Tex., is being organized to take over the plant of the Armstrong Steel Co., and the latter name will be discontinued. Extensions will be made, including the installation of an electric furnace and other equipment. J. T. Foster is manager.

Cotton compressing machinery, power equipment and transmission apparatus to cost about $30,000 will be installed in the new plant, 200 x 400 ft., to be built by the Laurel Compress Co., Laurel, Miss., recently organized. D. F. Grandberry is president.

The Tubbock Cotton Oil Co., Colorado City, Tex., will build a new four-press cotton oil mill, estimated to cost $200,000, including machinery. It is planned to double the plant to an eight-press mill in the near future at a like expenditure.

The Stevens Pyrites Pressed Brick Co., 418 Stovall Building, Tampa, Fla., recently organized, will commence the erection of a new plant, 80 x 250 ft., with power house, to develop an output of about 40,000 brick per day. The machinery installation is estimated to cost $36,000. Fremont C. Stevens is president.

The American Wheel & Rim Co., P. O. Box 1012, Birmingham, recently organized with capital stock of $1,000,000, will build a local factory in the near future and at that time will be in the market for equipment. G. P. Caldwell is secretary-treasurer.

## Indiana

INDIANAPOLIS, June 4.

TENTATIVE plans are being considered by the Leonard Range Co., Washington, Ind., for a new one-story plant to cost approximately $100,000, including equipment.

The Chicago & Eastern Illinois Railroad Co., 332 South Michigan Avenue, Chicago, has taken title to 110 acres between Terre Haute and North Terre Haute, Ind., as a site for its new locomotive and car shops. Plans are under way for the initial buildings, the ultimate cost to be close to $4,500,000.

Traveling cranes, hoisting equipment, conveying machinery, etc., will be installed in the five-story freight terminal and warehouse, 195 x 245 ft., to be erected at Oliver Street and Kentucky Avenue, estimated to cost $1 000,000, by the Terminal Building Corporation, affiliated with the Indiana Refrigerating Co., 232 Pennsylvania Avenue, Indianapolis. Rubush & Hunter, American Central Life Building, are architects. B. E. Metcalf is secretary.

The Gerber Ladder Co., Decatur, Ind., will commence the erection of a new one-story factory, 60 x 120 ft., for the manufacture of folding ladders, hardware specialties, etc., estimated to cost about $30,000 with machinery.

Fire, May 22, destroyed a portion of the plant of the Columbus Wood Turning Co., Columbus, Ind., manufacturer of handles for small tools, etc., with loss estimated at $25,000, including equipment. It is planned to rebuild.

A manual training department will be installed in the proposed new two-story high school to be erected at Muncie, Ind., estimated to cost $150,000, for which plans will be prepared at an early date. The Harrison Township Board of Trustees is in charge.

The Southern Indiana Gas & Electric Co., Evansville, Ind., is concluding negotiations for the purchase of the Mount Vernon Electric & Power Co., Mount Vernon, Ind., for $150,000. Extensions will be made in the power plant and system, including additional equipment.

The Stutz Motor Car Co. of America, Capitol Avenue and Tenth Street, Indianapolis, has leased a three-story building adjoining its plant, totaling 15,000 sq. ft. of floor space, for an extension.

The plant of the Stewart Wire Wheel Co., Frankfort, Ind., has been acquired by the Red Ball Transit Co., Indianapolis, operating a fleet of motor trucks for transportation service. The structure will be remodeled for the general manufacture and repair of motor trucks and parts exclusively for company service. W. B. Hiner is president and treasurer.

C. F. Pritchard, Indianapolis, has arranged for the establishment of a new plant at Collins and Thirteenth Streets for the manufacture of concrete blocks and other concrete specialties.

The Premier Motors, Inc., Indianapolis, Ind., has been organized to take over the plant and property of the Premier Motor Corporation, now in receivership, at North Olney and Twentieth Streets. The new company plans the immediate remodeling of the works for the manufacture of the regular Premier automobiles and taxicabs, including the installation of additional equipment for the latter branch of production. Frederick L. Barrows, formerly vice-president of the Lexington Motor Co., heads the new organization.

## The Pacific Coast

SAN FRANCISCO, MAY 23.

BIDS are being asked by the Western Pacific Railroad Co., Mills Building, San Francisco, for the erection of additions to its car and locomotive shops at Sacramento, Cal., to provide for an increase of about 50 per cent. The new structures will cost approximately $225,000, including equipment.

The White Star Oil Co., Los Angeles, has acquired property at Wilmington, Los Angeles Harbor, and will have plans drawn at once for the erection of a new oil refinery to cost close to $1,000,000, with machinery. A power house and machine shop will be constructed.

The Merritt Concrete Products Co., 727 Chapman Street, San Jose, Cal., is contemplating the erection of a new plant on the Monterey Road, estimated to cost $50,000, with machinery.

The Grand Rapids Show Case Co., Grand Rapids, Mich., is considering plans for a branch plant at Portland, Ore. It will include a power house and machine shop, and will cost close to $500,000 with machinery. S. D. Young is president.

The Robinson Gear & Machine Works, Seattle, has leased a one-story building to be erected by John H. Scott on Bell Street, 60 x 120 ft., and will equip it as a machine shop.

The Pelton Water Wheel Co., Nineteenth and Harrison Streets, San Francisco, manufacturer of water turbines, pumps, etc., has acquired property for a two-story addition, 150 x 200 ft., for pump assembling, machine and other operations. The company will also enlarge its machine shop and install additional equipment. The expansion will cost $350,000.

The Consolidated Gas & Electric Co., San Diego, Cal., has arranged for a bond issue of $1,988,000, a portion of the proceeds to be used for extensions in electric plants and system and the installation of additional equipment.

The Northwestern Mill Co., Hoquiam, Wash., is considering plans for rebuilding the portion of its plant recently destroyed by fire with loss estimated at $50,000, including equipment.

The Northwestern Equipment Co., Seattle, manufacturer of logging trucks, etc., has leased a portion of the former Standifer Shipbuilding Co. plant at Vancouver, Wash., and will remodel it for a branch factory.

A manual training department will be installed in the new high school to be erected at Montbello, Cal., estimated to cost $200,000, for which bids will be taken at once on a general contract. Jeffery & Schaefer, 1106 Kerckhoff Building, Los Angeles, are architects.

The Hoyt Heater Co., Los Angeles, will erect a new one-story plant, 100 x 125 ft., at Vernon for the manufacture of heaters. Walker & Eisen, 325 Pacific Finance Building, are architects.

The Clear Fir Lumber Co., Tacoma, Wash., has tentative plans for rebuilding the portion of its mill recently destroyed by fire with loss approximately $40,000, including equipment.

The McGuire Cabinet Co., 1514 Hooper Avenue, Los Angeles, has awarded contract to J. W. Johnson, Bryson Building, for a two-story addition, 30 x 147 ft.

The Board of Education, Pasadena, Cal., will commence the construction of a new opportunity vocational school to cost close to $190,000. Allison & Allison, Hibernian Building, Los Angeles, are architects.

The Main Iron Works, 1000 Sixteenth Street, San Francisco, is in the market for a 150 or 200-ton standard sectional hydraulic flanging press, 1500 lb. working pressure; also one 10 to 16-ft. vertical boring mill, motor driven.

## Canada

TORONTO, June 4.

Several good sized lists for equipment were the chief factors in rounding out a good month in the local machinery market. According to some local dealers May will show a general improvement in sales compared with other months this year, while at the same time there is still a good volume of business pending which is expected to close within the next 10 days. Although the greater part of individual orders runs to two or three tools to a customer, some larger sized lists are making their appearance. Many industrial concerns throughout Canada are installing more up-to-date equipment and the demand on replacement account is active. Small tools are moving freely.

The R. McDougal Co., Galt, Ont., received an order from the Riverdale Technical School, Toronto, for 10 lathes, and D. McKenzie, Guelph, Ont., an order for 11 lathes from the same source.

The Granby Consolidated Mining & Smelting Co., Vancouver, B. C., is building a new ore mill and concentrator at Granby, to cost about $600,000.

The Canadian Power Co., Niagara Falls, Ont., is building an outdoor transformer station to cost approximately $150,000 which will have a capacity of about 60,000 hp.

The Toronto Transportation Commission, Toronto, has awarded contract to Sullivan & Fried for the erection of a car house at the corner of Roncesvalles Avenue and Queen Street, to cost $300,000.

The machine shop and repair department of the Montreal Harbor Commission, Montreal, was destroyed by fire with a loss to building and equipment estimated at $100,000. It is expected that rebuilding will be started immediately.

The plant of the Oakville Wire-Bound Box & Basket Co., Oakville, Ont., was destroyed by fire with a loss to building and machinery of $225,000. D. Chapman is manager.

It is reported that G. A. Maguire has resigned from the Canadian Tube & Steel Products, Ltd., and proposes to organize a company for the manufacture of wrought iron pipe. It is understood that the new company will operate under the name of the Tube Products, Ltd., in a plant formerly occupied by the Dominion Ship Yards at the foot of Bathurst Street, Toronto, for which a lease has been granted by the Toronto Harbor Commission.

The Capital Heating Co., Hull, Que., is having plans prepared by Brodeur & Pilon, 6 Hotel de Ville, Hull, for the erection of a factory on Montcalm Street.

The Arch-Schneider Packing Co., 145 Queen Street, Kitchener, Ont., is having plans prepared for addition to cost $100,000. Col. J. M. Schneider is manager.

The Hull Milling Co., London, Ont., contemplates erecting a 1,500,000 bu. elevator at Point Edward, Ont.

The Port Hope Sanitary Mfg. Co., Port Hope, Ont., has awarded contract to B. Pennington & Son, Port Hope, for the erection of a smelter building.

The Shawinigan Engineering Co., Shawinigan Falls, Que., is building a power plant at St. Etienne des Gres, Que., for the St. Maurice Power Co., Ltd., Cap de la Madeleine, Que.

The Gates Engineering Co., Ltd., Montreal, states that the report that it is in the market for machinery and equipment for the manufacture of fire brick, locomotive blocks and stove linings is incorrect, as it has no intention of manufacturing its own refractories. The company is engaged in engineering contracting, specializing in boiler and furnace brick work.

# Current Metal Prices

**On Small Lots, Delivered from Merchants' Stocks, New York City**

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

### Iron and Soft Steel Bars and Shapes

| | |
|---|---|
| Bars: | |
| Refined iron bars, base price | 3.54c. |
| Swedish bars, base price | 7.50c. |
| Soft steel bars, base price | 3.54c. |
| Hoops, base price | 5.19c. |
| Bands, base price | 4.39c. |
| Beams and channels, angles and tees 3 in. x ¼ in. and larger, base | 3.64c. |
| Channels, angles and tees under 3 in. x ¼ in., base | 3.54c. |

### Merchant Steel

| | Per Lb. |
|---|---|
| Tire, 1½ x ½ in. and larger | 3.60c. |
| (Smooth finish, 1 to 2½ x ¼ in. and larger) | 3.80c. |
| Toe-calk, ½ x ⅜ in. and larger | 4.60c. |
| Cold-rolled strip, soft and quarter hard | 7.50c. to 8.50c. |
| Open-hearth spring-steel | 5.00c. to 7.50c. |
| Shafting and Screw Stock: | |
| Rounds | 4.40c. to 4.65c. |
| Squares, flats and hex | 4.90c. to 5.15c. |
| Standard tool steel, base price | 15.00c. |
| Extra tool steel | 18.00c. |
| Special tool steel | 23.00c. |
| High speed steel, 18 per cent tungsten | 75c. to 80c. |

### Tank Plates—Steel

| | |
|---|---|
| ¼ in. and heavier | 3.64c. |

### Sheets

*Blue Annealed*

| | Per Lb. |
|---|---|
| No. 10 | 4.59c. |
| No. 12 | 4.64c. |
| No. 14 | 4.69c. |
| No. 16 | 4.79c. |

*Box Annealed—Black*

| | Soft Steel C. R., One Pass Per Lb. | Blued Stove Pipe Sheet Per Lb. |
|---|---|---|
| Nos. 18 to 20 | 4.80c. to 5.05c. | ..... |
| Nos. 22 and 24 | 4.85c. to 5.10c. | 5.35c. |
| No. 26 | 4.90c. to 5.15c. | 5.40c. |
| No. 28 | 5.00c. to 5.25c. | 5.50c. |
| No. 30 | 5.20c. to 5.45c. | ..... |

No. 28 and lighter, 36 in. wide, 10c. higher

*Galvanized*

| | Per Lb. |
|---|---|
| No. 14 | 5.10c. to 5.35c. |
| No. 16 | 5.25c. to 5.50c. |
| Nos. 18 and 20 | 5.40c. to 5.65c. |
| Nos. 22 and 24 | 5.55c. to 5.70c. |
| No. 26 | 5.70c. to 5.95c. |
| No. 27 | 5.85c. to 6.10c. |
| No. 28 | 6.00c. to 6.25c. |
| No. 30 | 6.50c. to 6.75c. |

No. 28 and lighter, 36 in. wide, 20c. higher

*Welded Pipe*

| *Standard Steel* | Black | Galv. | *Wrought Iron* | Black | Galv. |
|---|---|---|---|---|---|
| ½ in. Butt.. | —41 | —24 | ½ in. Butt.. | — 4 | +19 |
| ¾ in. Butt.. | —46 | —32 | ¾ in. Butt.. | —11 | + 9 |
| 1-3 in. Butt.. | —48 | —34 | 1-1½ in. Butt | —14 | + 6 |
| 2½-6 in. Lap. | —44 | —30 | 2 in. Lap.... | — 5 | +14 |
| 7-8 in. Lap.. | —41 | —11 | 2½-6 in. Lap. | — 9 | + 9 |
| 9-12 in. Lap. | —34 | — 6 | 7-12 in. Lap.. | — 3 | +16 |

### Steel Wire

| BASE PRICE* ON NO. 9 GAGE AND COARSER | Per Lb. |
|---|---|
| Bright basic | 5.00c. |
| Annealed soft | 5.00c. |
| Galvanized annealed | 5.65c. |
| Coppered basic | 5.65c. |
| Tinned soft Bessemer | 6.65c. |

*Regular extras for lighter gage.

### Brass Sheet, Rod, Tube and Wire

BASE PRICE

| | |
|---|---|
| High brass sheet | 20½c. to 21½c. |
| High brass wire | 21 c. to 22 c. |
| Brass rods | 18¾c. to 19¾c. |
| Brass tube, brazed | 28½c. to 29½c. |
| Brass tube, seamless | 25½c. to 26½c. |
| Copper tube, seamless | 27 c. to 28 c. |

### Copper Sheets

Sheet copper, hot rolled, 24 oz., 24½c. to 25½c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

### Tin Plates

| Bright Tin: Grade "AAA" Charcoal 14x20 | Bright Tin: Grade "A" Charcoal 14x20 | Coke—14 x 20: | Prime | Seconds |
|---|---|---|---|---|
| | | 80 lb. | $6.80 | $6.55 |
| | | 90 lb. | 6.90 | 6.65 |
| | | 100 lb. | 7.00 | 6.75 |
| IC..$11.00 | $9.75 | IC.. | 7.15 | 6.90 |
| IX.. 12.25 | 11.00 | IX.. | 8.15 | 7.90 |
| IXX.. 13.50 | 12.25 | IXX.. | 9.15 | 8.90 |
| IXXX.. 14.75 | 13.50 | IXXX.. | 10.15 | 9.90 |
| IXXXX.. 16.50 | 14.75 | IXXXX.. | 11.15 | 10.90 |

### Terne Plates

8-lb. coating, 14 x 20

| | |
|---|---|
| 100 lb | $7.00 to $8.00 |
| IC | 7.25 to 8.25 |
| IX | 8.25 to 8.75 |
| Fire door stock | 9.00 to 10.00 |

### Tin

| | |
|---|---|
| Straits pig | 45c. |
| Bar | 53c. to 58c. |

### Copper

| | |
|---|---|
| Lake ingot | 17½c. |
| Electrolytic | 17 c. |
| Casting | 16¾c. |

### Spelter and Sheet Zinc

| | |
|---|---|
| Western spelter | 8 c. |
| Sheet zinc, No. 9 base, casks | 10¼c. open 10¾c. |

### Lead and Solder*

| | |
|---|---|
| American pig lead | 8½c. to 9c. |
| Bar lead | 12c. to 13c. |
| Solder, ½ and ½ guaranteed | 33½c. |
| No. 1 solder | 31½c. |
| Refined solder | 28c. |

*Prices of solder indicated by private brand vary according to composition.

### Babbitt Metal

| | |
|---|---|
| Best grade, per lb | 75c. to 90c. |
| Commercial grade, per lb | 35c. to 50c. |
| Grade D, per lb | 25c. to 35c. |

### Antimony

| | |
|---|---|
| Asiatic | 8½c. to 9c. |

### Aluminum

| | |
|---|---|
| No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb | 32c. to 33c. |

### Old Metals

There is a little inquiry in the market and conditions seem to be brighter. Dealers' buying prices are nominally as follows:

| | Cents Per Lb. |
|---|---|
| Copper, heavy crucible | 12.75 |
| Copper, heavy wire | 12.00 |
| Copper, light and bottoms | 10.00 |
| Brass, heavy | 6.75 |
| Brass, light | 5.50 |
| Heavy machine composition | 9.50 |
| No. 1 yellow brass turnings | 6.75 |
| No. 1 red brass or composition turnings | 8.50 |
| Lead, heavy | 6.00 |
| Lead, tea | 4.50 |
| Zinc | 4.25 |